



# PANCHASIDHANTHIKA OF VARAHAMIHIRA

A REDISCOVERY OF INDIA

# PANCHASIDHAANTHIKA –The astronomical treatise of Varahamihira



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While I was an infant ,my grandmother used to show star clusters and teach me their names.I was fascinated by my star, Punarvasu shining bright in the sky.Then started to see the difference between it and the Thiruvathira,one is white and the other red.I didn't know that I was learning the luminosity of the stars at that age.

Now when I look at a Hertzsprung –Russel diagram(ref 20) I understand the educative process of the ancient Indian astronomers and how it started in infancy itself,when the child is brought out of the house for the first time to see the moon and the mother asks “Have you ever seen such a beautiful object?” I wonder whether the question was addressed to

the moon or to the infant. My granduncle, the philosopher-poet Nalapat Narayananmenon used to say,If there are people who don't believe in God,let them look at the stars and their rhythms.That is the sign of God.”

Almost similar words were said by Vincent Vangaugh “For my part I know nothing with any certainty ,but the sight of the stars make me dream.”

Astronomy means the measurement of stars and astrology means the knowledge of stars.Without measurement of stars we cant understand the stars, Two terms interrelated but often mistaken as science and nonscience respectively.

The study of astronomy had already evolved into the cosmology and origin and evolution of universe in India before the

vedic times and when we read an astronomical text like Panchasidhanthika we remember this. This was the defect which mislead Thibout and other western scientists when they tried to understand Indian astronomy in terms of Euclidean and Greek astronomy and divinations. The cosmological distances were measured by Indians thousands of yugas before Hubbles constant. How do I state that? There are some methods described in Varahamihira.

The stars close to us the best method is the combination of parallax (shift which is apparent change in position of star viewed from the earth at least for one year) and an esoteric technique(measurement of moving clusters). Another method is to look for the red shift in the spectrum and analyse the light from stars and galaxies.

The red shift shows that the star /galaxy is speeding faster away from us.In a cosmic distance ladder thus,our position (earth's) is at the bottom ,and the most distant galaxy is at top.Betelguese or Thiruvathira is thus a supergiant red, and Punarvasu is a white main sequence star. When the ancient astronomers say that the universe has already seen several yuga kalpa and is in the 7th Manuanthra of varahakalpa, they mean that the age of the universe is that much.(The cyclical time) And when this idea was first heard ,the astronomers of 16th century Europe thought it is an illusionary fantastic superstition of Indians. But now they too are saying the same thing.If  $H_0$  is  $70/\text{Km/sec/megaparsec}$  , the age of big bang is 14 billion yrs. They say that the expansion of universe will become slower and slower

(Qo as decelaration)as time goes by .This is equivalent to saying that the Kaliyuga which is fast will become slower and end up in a satyayuga again cyclically. We must remember that for modern scientists 300000 yrs elapsed after big bang for the galaxies ,clusters,superclusters of galaxies to be formed.Events and processes even long ago leave traces in universe.3000000-4000000 yrs after big bang the cosmos was permeated by sound waves.When Indian cosmology speaks about Naadabrahma, the creation of sound and light as a mandala, it is this ancient period. With generalization of Newton's mechanics , the spacetime near a massive object is found to be distorted by the object and this produce a basic effect as a gravitational pull and orbits are produced. The observed universe is only a very very

tiny part ,as Gargya says in his Goloka description in Gargasamhitha(21). Varahamihira and the other Indian astronomers were aware of these cosmological proportions of Garga and ancestors and this is reflected in their astronomical texts. We must also recollect that the general relativity and Newtons mechanics give only slightly different results. Distortion of space has a consequence which is very important. Light from an object ,directly behind another,more massive ,can have its direction changed so that the object itself appears to the observer to be shifted from its real position. An extended object can have the image changed called gravitational lensing. Any body with mass can lens any other body . The path of light can be altered by dark matter. When

slight distortion it is weak lensing. The amount of solar energy falling on surface reflected back to space .Fractions between 0 to 1 is the value and for earth it is 0.39 or 39% of light is reflected back .This figure is roughly one nakshathraavady (39-40) in Indian systems .

Another important matter I want to stress is that the MSL or mean sea level or surface level of sea horizontal to land ,and its ellipsoidal nature due to spin can be understood only after several thousands of years of observation by people who live in the seashore, and this observation for several generations of people at the coastal area make them understand the random waves, regular tides , atmospherical air pressures, Multiyear phenomena like Tsunami which come at

regular intervals, the monsoon winds etc and this is very important for any seafaring people. The seatrade of India is first mentioned in Rgveda which is very ancient and hence the seafaring activity and observation of sky and wind might have started several thousand years before the Rgveda. And hence, when varahamihira speaks of star observations, heliacal rising of stars and the classification of comets etc we must know the antiquity of such intellectual activity which is the unique heritage of India. It didn't start with Varahamihira. It is more ancient than the vedas. The observation of monsoon especially which is unique for Indian coast must be taken seriously because it will give you a clue to the fact about the mysterious Phoenicians who used the same script, the same techniques

of shipbuilding and trade as the Indians and vedic Aswins. None of these things were considered by Thibout(ref 22) when he placed Indian astronomy as a meager offshoot of Greek astronomy. And the modern historians also just repeat this mistake . To consider that the Reimann zetalandscape,with infinite zeroes at sealevel,(23) from the point of view of the Indian subcontinent ,the solution of Reimann problem may become easy.

The eqator is a great circle. After AD1600 we take Greenwich meantime ,but Greenwich is not on the equator. In India ,Lanka, closest landmass to the equator was taken as zero great circle. The longitude (Meridianal) that crosses Lanka at right angles to it,passes through India and this

was the Indian standard time all over Lanka and India. Such a unified system was never known to Greece or Rome and Only after India became a British colony, Greenwich was established clearly points to the fact that the west had been borrowing from east even in 16th century. In 1884 only, the 15 degree steps of longitude and 24 one hour time zones accepted at Greenwich. Hence the 24 hour(Hora) of India was known to Britain only after its contact with India, not with Contact of Greece or Rome which it had for several centuries. (The English translation of Thibout came 5 years after 1884 and when Einstein was only a child of 10 years is noteworthy.). To mention a latitude from the pole one has to mention the colatitude(reference pole whether from south or north) and Varahamihira mentions that in his tables

showing how scientific he is about the spherical stellar geometry of the cosmos. Modules of colatitudes are polar distances or the linear surface distance.

The meridional angle between any 2 points measured from difference in time at which some celestial body cross over the respective meridian. That is ,pass through the celestial meridian. The intersection line of celestial sphere and extended planes that define the meridians. For this a star is used,not the sun.Because of the complication of the earth's axis. Indians used 28 to 27 starclusters. from vedic times. For measuring latitude ,observe the elevation of a celestial object .Take difference in value and value at equator for the point on the same meridian. This can be obtained by a reference book called a

panchangam ,but has to be verified with sextants and Varahamihira explains how several observational instruments including a sextant is ,made.

Great circles are longitude,latitude and radian ,the 3-dimensional coordinates for that point.For an ellipsoidal globe ,the shortest path or diagonal/geodesic is not that simple.The geodesic does not lie in a plane.The difference in length between geodesic and great circle for a given pair of points on earth is relatively minor.

Computing the surface distances of 2 points of known longitude and latitude is with 4 steps,(We can do it from Lanka and Dhanushkodi in India)

(Modern:

1.In 3 dimensions connect the polar coordinates to Cartesian coordinates

keeping radius of earth as algebraic variable R.

2. Take dot product of the two Cartesian expressed vectors.

3. Because both the vectors are of length  $R_1$  the L between is  $\text{arc cos} (+0.45257) = 63.091 = 1.1012 \text{ rad}$  This being the arc subtending at earths center by the arc.

4. multiply the angle in radian by R

If  $R = 6371 \text{ km}$

Distance between  $1.1012 \times 6371 = 7015 \text{ km}$   
 $= 3788 \text{ INM}$ )

If R is 6379(as used in Varahamihira's book) 7024.5548 is the value. Poulisa takes it as 703 and others as 704. (6379 is the R of the earth's orbit and its nodes in Indian astronomy ,not of earth)

Varahamihira in sloka 12 chapter 3 clearly states that 704 is the uniformly accepted value in India (saagarahimaadriparidou is the word used by him-from ocean to Himalaya it is accepted) This statement clearly shows that Poulisasadhantha is truly Indian and nothing to do with Paul as suggested by 16th century writers. And also that a unified system occurred all over India.

In sloka 17 he gives an ancient method of observation .Observe the ravigathimaana in each month .In one hour of 60 mts it is in order Sikhi (3),agni(3), yama(3), rasi(2), viyutha(1),+1,+1,,+1,+1,-0,-1. This computed from chaithramaasa for 6 months is 57 ',57'.57'.57',58',59', and for the next 6 months, 61',61',61',61',60',59'. The addition of these gives 708.

Which is  $12 \times 59$ . But ,the other method in sloka 11 is  $12 \times 150 = 704$ . And India accepted these calculations.

If we draw the 2 great circles intersecting Lanka like this, the line of Ramasethu ,is the karna or diagonal connecting India (at Dhanushkodi) and Lanka(at Mannar) and it is an archeoastronomical line made by the stone age human beings of South India and Lanka.

If we make a flat square projection map, of the world, each coordinate multiplied by a unit of linear measure  $S=2$  mm per degree (multiplier). The whole world map spanning 36 cm by 72 cm is obtained. Scale is 1:300000000 at equator (Lanka or Mesha zero degree). Remember that for longitudinal zonation each parallel divide into 8 bands from 80°OS to 72°N + one 12° band from 72°N to 84°N zone is to one of these lines a 60X2 1200 near rectangle.



The easternmost islands from there is 100 degree east ,and on the west is  $175+75$  or 250 degree so that a total of 350 degree .The rest 10 degree is that of India and

Lanka together 10 degree longitude means 40 mts time difference between the eastern border and western border of India, and Lanka can be accepted as a midpoint to standardize this. The distance on map is 1:300000000 for those on earth. 1 cm on map is 3000 km on earth. From Aswathy to Chithra is polar longitude 180 degree but polar latitude is only 2 degree 43 'S, between karthika and chitra the difference is about 5 degree. and this is in the south India only. The observations are from the southern tip of India and Lanka and accepted all over India from very ancient times. And about the figures 36 and 72, as I have several times proved, it is an interdisciplinary number used in Yogasasthra, Indian medicine, musicology, and veda. (ref 24)

## Why did the Indian Rishi use decimal system?

Because logarithms is easy with 10 base decimal systems .And they used it for computations of astronomical projections ,not merely for flat geometry.but also for advanced mathematical calculations.They knew differential geometry since they are aware of the longitude increase clockwise at North pole and angle of longitude become clockwise in south pole or reverse, and for the calculation they devise various observational instruments.This is natural because they had been observing the clockwise and anticlockwise movements of winds and ocean currents of the sindhusamudram(Indian Ocean) for thousands of years .This also proves why

south Indians were the expert astronomers and expert seafarers.

Another important thing is a 6 mile wide NS band (5 degree 4') along every meridian was considered a township band or a naagaraseema. But this is at equator. At higher altitudes this is not uniform 49 degree N exceeded 0.8'

At 54 degree nearly 9 degrees

58 degree by 10 degree (that is not a uniform 6 mile wide meridian as at equator.)

The division line for the south intersect the parallel a little east of the corresponding line from the north. Such midway parallels are the connecting lines (sandha or sandhi) The discrepancy would be less than one cm. which accumulate arithmetically to the west and to higher

altitudes.If it is at equator ,at Lanka point this accumulation would not happen.To contain the accumulation effect,the scheme is reset every 4th degree of longitude with a new meridian defined as reference meridian in relation to Lanka/India meridian.

This can be like this.

0,102 W,,106W,110 W,114 W,118 W.Any position between 114 and 110 W will be west of 4th meridian.

If we decrease the clockwise angle from the north of any direction ,the direction east is said to have an azimuth of 90 degree.An aerial projection described as maintaining azimuthal angle at its central point .The distance from earth to moon is 35 0000 Kms .An aerial projection of earth is as seen from moon from 350000 kms.

So if we use the above map with 36 on one side and 72 the other,it can be used as a a real projection also.Varahamihira was very accurate in sin-, cosine balancing. Sine and cosine are male/ female/ sivasakthy/yin yan/and are defined algebraically as infinite series.Expressed as angles measured in radians The fractional function or the product of all integers upto the required value.The word projection is equivalent to shine a light from inside a transparent globe like sun, and catch the cast image on a piece of paper flat against else centered around the surface of a sphere.This was used by all astronomers of India.(Including vedic rishi and Varahamihira)

Trigonometry of Varahamihira gives projections for flat,cylindrical and conical films.15 degree for parallels and 30

degree for meridians were used,hence both are needed whereas Ptolemy gives only for 30 degree,varaha gives for both. This was because he knew what he was explaining and Ptolemy didn't .Projection onto a plane is azimuthal.onto cylinder and cone is cylindrical and conical .Plane shares a central point with the entire globe.(single point).The others a contact circle.Cylindrical with the great circle.Cone with a lesser circle.The contact circle developed became the contact line.If symmetrical to axis it is simple aspect, and any other position is oblique aspect. Gyrated 90 degree from the single is the transverse or equatorial aspect,simple aspect for azimuthal at pole is is polar aspect,simple aspect for cylindrical contact with equator is equatorial aspect .Cone is in contact with some other

parallel with gnomon (sanku) varahamihira did both orthographic azimuthal projection at pole, gnomonic central azimuthal projection at simple aspect. When central azimuthal gnomonic projection is used the projection point is center of globe or it is geocentric. This was adopted by Ptolemy from India but he didn't know the full story. At 45 degree the gnomonic map reaches the same diameter as the orthographic. In short, the astronomers knew the compound projection of mensuration formulae by which the circle of radius  $R$  and sphere of radius  $R$  and cone of base radius  $r$ . This is important since in vedic geometry this type of compounding was taught to students in creation of sacrificial altar. The integration and differentiation is the basic of calculus

and this was known to Indian astronomers .The 15 degree spacing parallel they called Hora and the 30 degree spacing meridian as raasi.

Differentiation is a process of mathematical analysis that for a given function derives a second function. Expressing the rate of change of value ,of the original arc we get the original function For eg ,the function that shows for some point X the cumulative distance traveled by a planet/a boat/car /or a train.Certain functions have a limit O ,several mathematical functions have that limit and are differentiable.Derivative sums of 2 differential functions equal the sum of their derivatives.The attributes equidistant,equal area,conformal are mutually exclusive of the other.The 4th ,the loxodrome (line on a map have

consistent Azimuthal leaning) which is of vital importance for ocean navigation .It is a subset of conformity. And it was this alone which Hipparchus,Ptolemy etc were concerned with . While Varahamihira and his ancestors were knowing it only as one of the subsets of their knowledge.

Comparison of scales:-

Length along the meridian of map/length along meridian of globe= length along parallel on map/length along parallel on globe.

OR

Length along meridian on map/length along parallel on map= length along meridian on globe/length along parallel on globe.

In history ,it is important to remember that the first Mercator projection was

made only in 1569(The Portuguese travel time)though a Etzlaub projection existed as early as 1511.Now flights use a loxodrome along parellel with a length of 8000 kms .The great circle routes by direct flights cross the 70 degree parallel or 7000 kms.

The general assembly 1979 International association of Geodesy for comprehensive international use named Geodetic reference system 1980 or GRS 80 based on geocentric rather than surface determinants are given which are comparable to the numbers used by the sidhanthas in Varahamihira's Panchasidhanthika.GM Gravitation constant  $3986005 \times 10^8 \text{m}^3\text{s}^{-2}$  including atmosphere(Indians 39 to 40)

J dynamic form factor excluding permanent tides  $108263 \times 10^{-8}$

Angular velocity of earth  $.7292115 \times 10^{-11}$  rads  $-1$

Flattening 1:298.257222101

Revised world geodetic system 84 or WGS 84. has minor variations.

(In Tamil poem Abhiraami Anthaadi ,sloka 65 speaks of Munnankirumoonru Which means  $3 \times 4 \times 2 \times 3 = 72$ , the vedic number. which is important both for musician and astronomer/mathematician of India.

)Equatorial radius accepted for earth for WGS84 of  $6.378137 \times 10^6$  m is for the satellite at a resulting altitude above surface of over 35000 KM .(ref 25)

( 6379 of Varahamihira is this calculation.)

The sine wave or sinusoid of soundwave and that of light were known to ancient Indians as we see from their musicological, astronomical and vedic calculations. They knew the phases  $0, \pi/2=90, \pi=180, 3\pi/2=270, 2\pi=360, 5\pi/2=450, 3\pi=540$ . Which was used for music and astronomical calculations. It is from this the sine –cosine balancing was done by all astronomers including Varahamihira. To know a sinusoid one has to know three specific things.

1The frequency or number of times per second . The waves repeat itself in cycles. A sound with periodicity has pitches. ordered on a musical scale. Pitch related to repetition rate and hence in case of

sinusoid to its frequency. This is also behind the afterbirth system of Indians.,

2. The amplitude. The amount of pressure.. variation about the mean.

3 The phase or portion of the cycle through which the wave has advanced in relation to some fixed point in time.

The concept of fraction as an infinite class of pairs is introduced from the vedic times onwards in India. This understanding is relevant to mathematics ,physics,

Einstein's theory of relativity and the Gauge theory of principles that describe the forms of nature according to modern particle physics. Why I am elaborating on these modern points is to prove that Varahamihira when he reached at the number of energy (which is that of

Einstein)was following the scientific methods.And that was not his own, but from the vedic knowledge.Pythagorus lived in Greece from 572-497 BC.Vedic knowledge was several millenniums ancient to that and the attempts of Thibout to bring the astronomical knowledge of India to Greece or Rome seemed very childish to me when I read his book in late seventies.

In Indian astronomy of Paithamaha sidhantha we find the squareroot of time(366days in an year)to be 19.14 ,while in other Indian systems it is 19.12(365 days)This means that a particle (earth) takes 365-366 days to complete one revolution around the sun and to change its position from A to B.Since the mean parispanda of a particle is proportionate to the squareroot of time ,this is obtained

and this when plotted on a square of sides 18, the karna or diagonal is 19.

When this law was proved by the western world? In Nature vol 311 , pp 101, (26) in the year 1984, we can find an article which states that the law was discovered by Feynman and Hibbs in 1965. Does this mean that the Astronomical sidhanthaas of yore were borrowing something from scientists in 1965?

If we apply the same logic , we will find that the proofs for Indian astronomy borrowing from Greek also is of this nature.

Did our ancestors had the insight to understand the measurement of a Dirac particle or a Brownian particle to apply that to earth and its movements? Did they know the macromodels of universe and

the micromodels of quantum behaved in the same way? This question requires a lot of study about the concepts of Indian astronomy and a comparative study of modern astrophysics and interdisciplinary study of other Indian sciences including classical music, samkhya, vaishesika, nyaaya darsanaas etc.

The LCM of the earth, Jupiter, Saturn to complete a revolution round the sun is 60 years. In multiples of the number, 60, 120, 180, 240, 300, 360, these 3 planets come to the same straight line. By 43200 years they come 720 times in conjunction. (In 4320 yrs 72 times) This was known to Indian astronomers who devised 60 yr cycles and a bigger 72 times conjunction cycles for every calculation

,astronomical and musical .square roots of 2 and of 2-1 are akarani according to Indian astronomy .By studying these infinitely nirmeya akarani numbers they postulated a system of infinite dimension or Anantham(a thousandheaded chiliahedron)in which recline the beginningless endless Naadabrahma as Achyutha(that has no death)as poorna (or soonyalike perfection called Zero)poojya . In 1889 G.Thibout did a translation of Panchasidhanthika with the help of Mahamahopadhyaya Sudhakaradwivedi ,published by E.J.Lazaruz and co,in Banarus medical hall press(27).This was when Einstein was a boy of 10 yrs.This book ,I found in the collection of late sri.Nalapat Narayananmenon.

If 19 is the squareroot of time ,that multiplied by its mirrornumber 91 gives

1729, the famous taxicab number of sreenivas Ramanujam. The autobiography of Richard Feynman , Bentam books , 1989(ref 28) has given the integer multiples used by Mayans and he has noticed this multiple of 91 in their astronomical calculations. The venus cycles into 4 divisions, the venus period, the multiple of 91 and 19 yielding a number which is minus one of satyayug a of India are noteworthy. To quote Feynman “I did not figure that one out nor has anyone else”(about 91 and its multiples)

From the two facts above we can actually figure out the reason why the ancients (both Mayan and Indian) were using these for astronomical calculations and for yugaganitham. This fact , does not mean that they were borrowing anything from Feynman or modern astronomy , but there

are many things we can borrow from their knowledge if we can decipher it properly.

Astronomical texts like Brahmasidhantha and Bhaskareeya ,according to Thibaut are only modified versions of the oldest Paithamahasidhanta. All the astronomical texts have tried to criticize other astronomers in a destructive way. But Varahamihira was an exception. He understood the need for codifying the ancient knowledge of astronomy, and comparing the five theories in existence. This fact shows that he was scientific to the core. He knew the existing 5 sidhanthas and their interrelations and differences and was very accurate in pointing out the merits of each. Historically this very fact makes it a far superior treatise than any other astronomical text, even Aryabhatteeya, which deals only

with one of the sidhanthas, the surya sidhantha.

Panchasidhanthika , being a karanagrantha is very scientific as Thibout has pointed out. The chapters on universe, cosmos, astronomical instruments, Jyothishopanishad are particularly interesting to any student of astronomy and history . The 5 sidhanthas dealt with are

1, Paithamahasidhantha

2 Vasishtasidhantha

3 Romakasidhantha

4 Poulis sidhantha

5 Suryasidhantha.

The 12th chapter which is the smallest is the oldest Paithamahasidhantha. Chaptrs

3,6,7,18 are Poulisasadhantha.9,10,11,16 ,17 are suryasidhantha. ch 8 is Romaka sidhantha and ch 2 is vasishtasidhantha. The other chapters are from these sidhanthas at random and with varahamihiras own theories and comparisons on them.13th chapter Thrilokyasamsthana gives the spherical/ elliptical nature of earth ,differences due to akshamsa,the qualities of universe as a gola etc.4th ch which gives thripurasna adhikaara and vrithamsalambarekha ganitha or spashtadhikara deals with comparison of Romaka,poulisa and suryasidhantha, and 14th advocates constant observation with astronomical instruments to be supplemented to mere mathematical calculations.The Romaka sidhantha with 2850 yrs as a yuga ,the anomaly or utkendratha of sun and moon

according to suryasidhantha, the anomaly of surya, poulisa, romakasidhantha as a table etc are very scientific according to Thibaut.. The method of obtaining it is given from suryasidhantha alone and the values from the others also, showing that he was using the formula of surya sidhantha and not of Poulisa or Romaka.

The 5 sidhanthas.

### 1. Suryasidhantha

66389 Adimaasa , 1045095  
varjithachandradina in 180000 yrs,

180000 is 1/24th of a mahayuga.

Therefore if we multiply the abovesaid numbers with 24 , and reduce the number of savanadina it would be 1577917800 (old suryasidhantham) In modern surya sidhantha it is 1577917828.

From this the year is 365 days 6 hrs 12 mts 36 sec 56 kala for modern suryasidhantha 365 days 6 hrs 12 mt 36 sec for Old surya sidhantha and for poulisasidhantha.

The paramochabramana of moon is 3231 days 23 hrs 42 mts 16 sec.

Modern suryasidhantha has 3232 days 2 hrs 14 mts 53 sec .

The mahayugabramanasamkhya in old suryasidhantha of varahamihira is 488219 while in modern suryasidhantha it is 488219.

The old sidhantha and Aryabhateeya consider 232226 as the brama of kranthibhedanabindu of moon. Modern suryasidhantha it is 232228. Both modern and ancient suryasidhantha uses 270 kala to find out the greatest akshamsa of moon.

Paramocha of sun in old sidhantha is 80 0  
 Aryabhata gives 78 0 and modern surya  
 sidhantha as 770 .The parallax of solar  
 eclipse is not understood by Thibout as he  
 declares in his prologue.

The complete and mean motions of the  
 different planets is given like this.

Old suryasidhantha   New suryasidhantha  
 planet

17937000 17937060 Budha/mercury

7022388 7022376 Sukra/venus

2296824 2296832 Chovva/mars

364220 364220 Vyazham/jupiter

146564 146568 Sani/saturn

Only Jupiter is exactly the same in the 2. For Aryabhata it is 364220. venus, mars and Saturn revolutions are same in ancient suryasidhantha, Aryabhata and poulis sidhantha of Bhattolpala. (which shows all of them were using ancient suryasidhantha as their basic text) Mercury and Jupiter have the same value as in Poulis sidhantha. The positions of ucha and manda, the diameter of upachakra of these two points, conjunctions etc are given in detail. The first sloka of 17th ch which deals with Tharagrahasphutee karana has the word surathrimsa which should be read swara thrimsa according to Thibout and this fact is not given much attention by many commentators .

## 2 Paithamahasidhantham

There are only 5 slokas from this sidhantha in 12th chapter. Thibout says that this is the oldest of the Indian sidhantha which is not influenced by any western sidhantha and it along with Gargasamhithaa, Jyothishavedangam and suryapragnaapthy form a group totally Indian and unalloyed by Greek or Roman ideas. He also says that it is jyothisha vedanga itself in the name of Paithamaha.

Paithamahayuga is the famous pancha varsheeyayuga of the Vedas. It has 5 solar years with 366 days, 60 solar months, 62 grahayogamaasa, 67 nakshathramaasa of the moon, and yugadi is Dhanishta where sun and moon meet. The longest day has 18 muhoortha, and shortest has 12 muhoortha. The length of day increase or

decrease in equal parts every day.

Paithamahasidhantha also speaks of Vyatheepathaniyama and a particular time for starting to count the pancha varshayuga. These two are unique according to Thibaut.

The second sloka says ,reduce 2 from the saka era, and divide the rest with 5.

Other observations Thibaut made on Paithamahasidhantha are

- . 1 The Brahma-sphuta-sidhantham of Brahmagupta is different in content from Varahamihira's paithamahasidhantha.
- 2. The known Brahma(paithamaha) sidhantham as a part of Vishnu dharmotharapuraana is a small book in prose.
- 3. There are 4 Brahma-sidhanthas known which include part of vishnudharmothara,

part of panchasidhanthika, Brahma  
guptha's sphutasidhantha, and saakalya  
sidhantha.

### 3. Romakasidhantham

For Romaka, poulisa, and Vasishta  
sidhantha we have no other reference  
Grantha except Varahamihira's pancha  
sidhanthika.

Thinking that Romakasidhantha and  
Poulisasadhantha are borrowed from  
Greek and Rome, Thibout has given a  
detailed account of them. We will first see  
what he has to say about them.

Romakayuga is a lunisolar yuga and have  
1050 adimaasa and 16547 thithipralaya in  
2850 yrs. Because of adimasa and varjitha  
chandradina of 150, for 19 solar yrs 7  
adimaasa and 235 grahayogamaasa are

there. He thinks that the Romakayuga is the Meton's period of Athens who lived in 430 BC. Meton had modified the Greek calendar with 235 planetary conjunctions and 19 yrs. But, the other things, like a period of 2850 (multiplication of 150) ahargana, already past days, total solar years, lunar months saavanadinam and a cyclical yugaganana are totally unknown to Meton. Metonic period is very simple and does not have all these complicated calculations according to Thibout. But then, He assumes that, the Indian astronomer might have taken the very simple Metonic period (borrowed is the word) and then made it complex by applying all the old Hindu systems of calculations on it!

How did the Romakasidhantha achieve this?

2850 is the Romakayugasankhya. Multiply it with 12 which is the solar month ,add 1050 to get grahayogachandramaasam (1050 adimasam0,then multiply with 30 to get the chandradina. Reduce 16547 thithipralaya to get 1040953 which is the saavana or solar days,

Dividing this with 2850 you get 365 day,5 hrs,5 mts,12 sec.

To get a poornadinasamkhyा and to divide with 19 ,Romakasidhantha took 2850 is his explanation.Then he says something more:-Romakavarsha is upto its second ,the ayanavarsha of Hipparchus .The ayanavarsha of Hipparchus was borrowed by Ptolemy and from him Romaka has borrowed .This is the view Thibaut has given.

(Remember the following chronological events .

430 BC The time of Peloponnesian war and the time of Socrates, Plato and Hippocrates when Indian pepper became very common commodity in Greece not as a food additive but as a medical ingredient and it was during this time of increased trade with India Meton came up with his partial knowledge theory of what is now called the Metonic period.

334 BC Alexander of Macedon invades Asia on advice of Aristotle his Tutor. In 327 BC he is in North India and but had to abandon his plan of invading Ganges valley because his army is tired and wants to return. Alexander dies in 323 BC and museum of Alexandria was founded by Ptolemy, also a student of Aristotle.

300 BC Elements by the Greek Euclid.who founded a school in Alexandria.

275 BC Ptolemy 2 and a flourishing museum at Alexandria.(After Alexander and his invasion,only Ptolemy comes up with his astronomical findings.Every contact with India has brought new knowledge to Greece,not otherway round

.

272 BC Ptolemy annexes Miltus, Phoenicia, maagas and Antiochus.

265 BC Archemedes in Alexandria as a student invent a screw for raising water.

260 BC Asoka adopts Budhism

45 BC Julian calender of 365 .25 days introduced by Julius Caesar through sosigenes of Alexandria makes January 1 the first day of the year.

7 BC Christ is born. Saturn and Jupiter conjunction in Pisces. stellar flareup of a supernova in sky for 70 days in the spring of **5 BC** noted by Chinese and Korean annals.

29 BC Jesus has last supper. Jesus lived only 32 years according to traditional belief which shows the Chinese and Korean chronicles to be true.

AD 40 voyage of Hippalus who says he has discovered the monsoon winds. He arrives at Madras coast.

AD 90 periplus of erythrean sea romans break monopoly of arab ships in spice trade

AD 95 aqueducts and public baths appear in in Rome whereas it was there in India from Mohenjadaro times.

AD 250 arithmetic of diophanes the first book of algebra appear.

Aug 29 AD 284 the first calendar to be adopted by Egyptian coptics and Abyssinians

AD 312 constantin see vision in sky of luminous cross with in hoc signo vinces (by this sign thou shall conquer) next yr accepts Christianity

AD 320 Gupta unify north India after 5 centuries)

These figures speak for themselves to see from whom who borrowed.

The next observation made by the translator is that the method of finding the mean for sun and moon are different

from usual Indian system.75 degree is paramocha of sun ,Without determining the position of the moon,the paramocha position is directly derived from paramocha .The Kendra or center here is the utkendra or anomaly of moon.The revolution of the anomaly is 110 times in 3031 days or to reach back in the same paramocha position it takes 27 days 13 hrs 18 mts 32 sec and 7 kala

But it is given as 27 days 7 hrs 43 mts 6.3 sec.Reducing the mean rekhanasa from paramocharekhansa we get sun's anomaly. Without giving this rule Romakasidhantha just states the numbers for the equations.The highest known anomaly equation in India is 2 degree 10 mts and 13 sec in suryasidhantha.The value of Romaka is 2 deg 23 mts 23 sec and Ptolemy gives 2 degree 23 mts.

Anomaly measure 15 0 30 45 60 75  
90

Anomaly formula

Romaka 34 0 42" 1 0 8'37" 1 0 38'39"  
2 0 2'49" 20 17'15" 2.023'23"

Ptolemy nil 1 0 9' nil 20 1' nil 2023'

Thibaut in his eagerness to prove the correctness of Ptolemy says that the three numbers given by him are the numbers for the anomaly ,while Romaka sidhantha of India without considering the anomaly difference uses indiscriminately the same equation to all places at every 15 degree.He fails to see the accuracy of the Sidhantha in finding the values for every 15 degree (not just 30 degree as Ptolemy)so that any one can see the differene as well as the method of

calculation (mathematical precision has to be maintained as well as conveyed to next generation). If such minute details are given by the Indian system and not by the Ptolemaian system the more possibilities are that Ptolemy due to his Indian connection has borrowed from India and not vice versa.

The time of revolution of the moon's node as 6796 days 7 hrs of Romaka and 6796 days and 14 hrs of Ptolemy match well.

The highest akshamsa of moon is given as 240, and 270 in 2 slokas while usually in Indian system it is 270. Dwivedi has explained it as the highest and the lowest but Thibaut thinks that it is something which is not correct.  $21/9$  as the fraction, if 9 is the smallest radius should give 280 not 270, as highest akshamsa, he argues.

Then he muses: The same book, giving

different values may confuse us, but they are laws given in different books, different sidhanthas (of different observers in different spacetimes) with comparisons and hence, though we are unable to understand them must be scientific.

The mean diameter of sun and moon is  $30'34'$  and the law to calculate true diameter is given. (from mean diameter and true motion according to Indian astronomy) The highest parallax in Indian astronomy is mean motion for 4 naadi. The law to find parallax is given in detail as in any Indian system. Aharganaganithan is for yavanapuri and position of sun and moon is for ujjain. The difference in rekhansa of these 2 areas is given as in poulisa sidhantha, In 3rd ch, 34th sloka Varaha gives certain facts about the beginning of Romakayuga which Thibaut says he could

not understand.(This will be discussed later)

Colebrrooke and Baodaji thought sreeshena wrote Romakasidhantha. Thibaut thinks that sreeshena has done a commentary on moolaromakasidhantha, The manuscript in India office library of Sphutasidhantha ,of Bombay Govt, and of Banaras college library ,and Berlin Royal library (11th chapter Thanthrapareeksha) has a part which has some important differences. India office Library manuscript mentions Lalasimha while others say Latasimha.in first line. The 5th line speaks of Latasurya. 7th line of Berlin manuscript gives Vaasishtaannam jayandikruthapadaan, Of Banares manuscript Vaasishtaa dwija

Bombay manuscript Vaasishtaad bheda  
yugadikrithapaataataath.

8<sup>th</sup> line of Bombay ,Banarus manuscripts  
Paridhipaathaspashteekaranaadyama

9th line Berlin manuscript ethanena  
griheetwa chandraratnochayaromaka:  
thatha:kanthaa

Banares manuscript:griheetwa  
ratnochayaromakakritha:Kantha:

Bombay manuscript :Grihetwaa ranno  
chaparomakatkritha kantha

From these Thibaut reads the sloka as:-  
Sreeshena ,vishnucandra, Praduymna,  
Aryabhata, and Lata, and Simha did  
discussions on subjects like eclipses, and  
from these discussions their ignorance is  
seen. In the first chapter what I said about  
the criticism of Aryabhata is applicable to  
the others also with some modifications.

But Sreeshena took mean motion of sun and moon, paramocha of moon, kranthibhedanabindu ,mean motion of mars,mercury ,Jupiter,venus,Saturn from Lata,.The past years ,yugabramana from Vasishta,Paramocha ,prakchakra,graha motions and kranthibhedanabindu from Aryabhata.Thus borrowing from various sources and joining them ,he made the diamond mine of Romakasidhantha into a broken old cloth.(kantha).

Moolaromakasidhantha is not what is given in Brahmagupta,(which is from sreeshena)and it is as given by Varahamihira and it has not borrowed anything from Aryabhata also according to Thibaut which is a very salient point.

Coming to the first chapter (8,10 sloka for aharganaganitha) of Varahamihira where a time cycle of Romaka is given:Reduce

427 from current sakavarsha when sun has halfset in the Monday of chaithrasuklapaksha. The rest is converted to solar months. Add lunar months passed in the current year. Write the number in 2 places. First place is multiplied by 7 and divided by 228. This adhimaasasankhya is added to solar months and multiplied by 30 and the already passed thithy added. The number written as 2 places. The first place multiplied by 11 and 514 added. Reduce from the already obtained thithi/ This gives the savanna aharganam according to Romakasidhantha.

I did this for 1987 March 16 suklapratama 1909 chaithram 2nd at sunset of yavanapura and midnight of Indian subcontinent (see page 60 of second edition of Panchasidhanthika NBS Kottayam)

$1909-427 = 1482/12 = 123$  balance 6

$7 \times 6 = 42/228 = 6.19$

$6.19 \times 30 = 1857.0 + 1$  thithi That is on 16th it is 1858 thithi.

$1+8+5+8=22$

$2 \times 11 = 22$

$514+22=536$

$536/703=0.71$   $367/703$

$1857-0.71=1857.29$

This can be written either as

1. 18500000

72000

9.

2. 18000000

570000

2000

9

3. or simply as

1800.00

57.29

which is 27.29 or roughly 28 days more than oldest Paithamahasidhantha

A very important factor is that the value 57.29 is the value of  $180/\pi$ . The current value for one rad is almost the same.

$180/r=57.29578$  (57° 17' 44.8") which is a trigonometric function and describes sin and cos. balancing. Radian being an angle subtended by a section of the circumference equal in length to radius, the radian is such that

$2\pi$  rad = 360 degree

$\pi$  rad =  $360/2 = 180$

$\pi/2$  rad = 90

1 rad=180/pai=57.17.44.8as given above

The new value is when we take earths circumference as 40000km or 25000mile with average radius of 4000 miles or 6371 Kms.But in Ptolemy and Romaka it is taken as 6973(for equator).which is 602 Kms more than the modern value.Hence the difference .The zero degree is in equator at lanka.24 degree at Ujjain and then the 3rd point is Yavanapuram.We must also understand that the present Greenich as zero line was accepted only after India became a colony of the British and the British understood the importance of having a universal timezone as accepted in India(Lanka being Mesham zero point equator).

What is significant is that 2850 of Romakayuga is derived from Paithamaha

which Thibout himself considers, is untouched by the Greek influence.

$366 \times 5 = 1830$  days in paithamahayuga

$366 \times 7.7868$  gives 2850 days.

$2850 \times 12 = 34200$  Solar months

Add 1050 Adhimaasa = 35250 multiply by 30 to get lunar days of 1057500 minus 16547 thithipralaya to get 1040953

$2850 \times 366 = 1043100$

difference 2147 days or 5.8 yrs

In 19 yrs  $5.8 / 2850 \times 19 = 0.039$

Which is 3 nakshathraavadi / 1000. This difference is nullified in 19 yrs. 150 such short 19 yr periods 2850 is a number which encompass the Comet of Halley also which is not seen in Metons cycle ,but in Indian cycle. 58.50 is the difference for 28500 yrs for mathematical calculation of

paithamaha and romaka but that calculated difference is not there in actual practice ,because of the savya apasavya movement of zodiac correcting itself.So the confusion is manmade, and if one goes back to the beejaganitha and compare the various systems ,there is no need to change everytime a difference is noted by a particular astronomer.(which according to the modern quantum mechanics views also can be accountable)

Saka 427 :-The long list of astronomers given to Dr William Hunter by the astronomers of Ujjain (Algebra XXX111 Colebrooke) has 2 varahamihiras.The second Varahamihira's time corresponds to saka 427 while the first was the contemporary of Chandragupta Mourya (During/just after Alexander's time BC )Alberuni thinks that it is the second

Varahamihira who wrote panchasidhanthika. All calculations of varahamihira's date of birth is based on this. No one ever thinks about the possibility of the first Varahamihira as the author. The period of Latadeva , the commentator of molaromakasidhantha is mentioned by Brahmagupta and Varahamihira and he is considered as a remarkable astronomer prior to sreeshena and very scientific. But Thibout fails to see that this Latadeva could be one who lived in Lotal or Lothal , a very ancient city of India and a good port city connected with seatrade.of Indus people. The date given for him by the Europeans is AD 505 .

In India there is a way of calculating a new saakha era according to change in the

saakha or clan of the ruling kings. According to this after chandrvansa of yudhishtirasaakha, the 4th saakha last king was Killed by Vikramaditya of Ujjain , King of Avanthi who ruled for 93 yrs (killed by Saalivaahana king Samudrapaalayogi of Parthaa.) and the 6th saakkha yr started with Saalivaahanasakha of samudrapaalayogi lasted for 372 yrs 4 months and 27 days. Varahamihira 1 lived during the reign of vikramaditya 1 of Ujjaian. 327 BC is Chandragupta's time. 235 AD is the ascension of Salivahana and hence of salivahanasakha beginning. Vikrama saka started 88 yrs before saalivahanasakha. And it represents the Yavana or Alexandrian Abdam .

Things to remember before we proceed

1.The difference between Saalivahanasaka and Christian era is 88

2.We now think that kali era started in BC 3104

3.Alexanders invasion in 327-325 BC. Seleukas as Sandracottus.(ChandraGupta)

From 299 –275 BC Bindusara (samudraGupta)

273-236 BC Asoka (His coronation 269BC)

4.The Salivahana or the sathakarni ruled from 235 BC to 225 AD for 460 yrs in the east and western coasts of India (the samudrapaalayogi saakha)Of these the Gouthamiputhrasathakarni from 70AD to 95 AD was named the thrisamudra thoya pitavaahanan ,and is identified as the Parthian Bhiman Kadphises or Kunda varman

5.If we take these into consideration , Asokan's rule(Vikramaditya saaka ends at 236 BC and the samudrapaalasaakha starts at 236 BC (exactly the time of the sathakarni rule.But ,Here it is said that the saaka ruled only 372 yrs while Indian history tells us they ruled till 225 AD for 460 yrs.

The discrepancy is not one of yrs, but one of starting a new era.

Count from 236 BC +373 yrs of Samudra paalasaakha we get (373-236= AD 137) AD 137+88 is AD 225 which Indian historians has accepted .

6.Why was 88 added?

Because that is the difference between the Christian era and the Saalivahana era

.and the difference between the Vikrama and Salivahana era also

7.This is Christian era 2007.

Saka 1929 . Then the difference is only 78. Not 88.Then why add 10 yrs more?

8.Kali yudhishtirasaaka year at present is  $3104+2007=5111$

But that began ,during reign of Pareekshith when he did the sapthaha the Mahabharatha was retold by Vaisampayana, and the actual deluge occurred 88 years back at the end of Dwaraka in a deluge and death Of Krishna ,in the first year of Yudhishtira reign.

The difference of 78 and 88 is 10.The correction of 10 yrs .That is ,the correct value of the deluge is in 3114 August 11th as given in the records of Ukathan ,and in India also this was calculated in the same

way, but due to the habit of making a new era for a prominent king, and thus changing the years, so that lay man lost track of it, but astronomers didn't lose track (like Varahamihira).

Krishna and his Dwaraka were lost to us in deluge in BC. 3114 August 11th in a sraavana month (still we celebrate it as Onam) This +2007 makes it 5121 years not 5111 yrs. Kali entered earth 5121 years with Krishna's death and the deluge. All these complicated looking but simple history of astronomy also provides us with the fact that Meton when he got partial information was not aware of the science behind astronomical and astrophysical theories. Not even Ptolemy had understood it except partially as the table

shows .Romakapura is not Rome but Romakapura is said to be in the Americas and the exact longitude is given in Panchasidhanthika .That was the abode of the sculpture Maya(also designated as Yavana)the father of Mandodari,consort of the great Ravana of Lanka.The intercontinental and searoute connections of India and the evidence of it in astronomical texts like Panchasidhanthika should not be slighted because it will provide several clues to the evolution of human thought on earth and its globalisation without power politics.but through friendly trade relations.

#### 4.Poulisasadhantham

Poulisasadhantha is not understood properly by Thibaut as he tells us.The important points are the sidhantha use

rithusapthanavabhaktha and thririthu (976 and 36 are to be reversed )use 3031 as divisor as Romakasidhantha, but most of the rules in this are the same as the Tamilspeaking south Indian people in Deccan who use vakyam or vararuchi vakyam for mathematical nemonics. There are 4 periods in it. Devamsam is 248 days in which 9 revolutions of moons epicycle happen. 3031 days is kaalaneelam and has 110 revolutions. raasagharika has to be multiplied to get veda which is 1600984 days Divide ahargana by 12372 ,balance is divided by 3031.the balance with 248. The balance with moons true place and daily motion for 248 days are computed and used. This is called chandravakyam dhoomravaahanam according to Warren. The second varahamihira was the son of Vararuchi and was called Narayanathu

Branthan by local kerala tradition because of his experiment on geodesic using rocks of different sizes to be thrown down a steep mountain at Pattamby (Rayiramangalam). The period of Ad 505 is that of Narayanathu Branthan or varahamihira second who was a favourite of Gupta king and a contemporary of Aryabhata.

The law to find the position of sun is the same as Romakasidhantha.In this also for 30 degree only anomalies are given as Ptolemy without the general equation to find it out.Instead of starting from the mandocha the degrees of anomalies start from Mesha 1, and this point is specifically noted by Thibaut(which is an Indian way of having Lamka as Mesham 1 degree)The paramocharekhansa is 80 degree which also conforms to south Indian and Lankan

position to the poles. The highest rekhansa for moon is 270 but when total lunar eclipse is calculated the rekhansa of moon is 240, which is seen in Romakasidhantha also. Thibaut thinks Poulisa is ancient than Romaka and suryasidhantha and he hasn't given any common mathematical rule for astronomical calculations but just states the formulae for them. Mean diameter of moon is 34' and that of chaaya is 76' in 6th chapter but in 7th chapter poulisa gives entirely different values.

7th ch first sloka is for calculating parallax of rekhansa but nothing for parallax of akshamsa. The most interesting part of Poulisasadhantha according to Thibout is the longitude difference between Yavanapuram, ujjain and kasi. Table of vrithaamsalambarekha given in 4th ch seems to be common for all the

sidhanthas. This table divides radius into 120 parts, and each of 120 parts into 60 each (total 7200). After observing this very important factor, Thibout fails to see that it is the way the vedic astronomy of Rgveda, the vedic musicology of saamaveda, the yoga science of Pathanjali divide cosmos, musical repertoire, and the biological physical body with its naadi (interdisciplinary Indian system). He says that it is the Greek style borrowed from Greek astronomers. But wherein Greek system is such an interdisciplinary approach found? Since this is found in Rgveda, does Thibout think that Rgveda also is borrowed from Greek? Ptolemy divide radius into 60 parts, not 120 parts, and the values of vrithamsalambarekha used by him are the same as that of the Indian system. When Ptolemy makes the

120 parts of vyasa into mts and seconds Poulisasadhantha and panchasadhanthika divides 60 parts thus.(Thibout is confused just like Ptolemy over this division.)That simply shows that Ptolemy had borrowed from India and the tables and the numbers for the jya added just as the half of the angles and their vrithamsalabrekha. (The vice versa as Thibout suggested can never happen from these facts)Recently I read a book by Subhash Kak, on astronomical code of Rgveda which shows circumstantial evidence of how scientific and vedic was Varahamihia's knowledge as I had explained in my commentary to his text..

The Poulisasadhantha known to Bhattolpala, Pridhoodakaswamy and the facts collected from these two by Colebroke are the other sources which

Thibout has. The poulis sidhanthum of these sources obey the rules of surya sidhantha and Aryabhatteeya, and is different from the ancient poulis sidhantha of varahamihira which is more ancient.

## 5. vasishta sidhantha.

Only very little is said about vasishta sidhantha in pancha sidhanthika because it is very ancient. The latter half of second ch is vasishta sidhantha. It gives a rule to calculate the length of day at any time. The laws have similarity to both poulis and paithamaha.

Vasishta, instead of using stellar mathematics, divide the sphere into rasi, mt, second, the spherical geometry.

Vasishta knows lagna as the point which

rises in the east at a specific time/event. This is a very important point.

The latitude and longitude of certain stars (sandhinakshathra) are given as a table. Wittney suggests that this is done by converting numbers into polar longitudes (dhruvarekhansa) and latitudes (vikshepa) which is the Indian style. Thibout says it is not clear why only 7 stars are given. Look at the table below.

Panchasidhanthika	
Suryasidhantham	
star	Position in starclusters
dhruvarekhansa	vikshepa
starclusters	dhruvarekhansa
1 karthika (pleides)	6 0 32 0 40'
100 50'	370 30'
2 Rohini Aldeberan	8 0 48 0
0 30'	49 0 30'
	5 0
	N S
	3 0 10' N
	9

3.punarvasu Pollux 8 0 88 0 7015'NS

13 0 93 0 6 0 N

4.PUSHYAM 4 0 97 0 20' 3 0 10 N 12

040' 106 0 0

5Ayilyam 1 0 107 0 40 ' 54 0 SN 2 0 20'

109 0 7 0 S

6.Makham 6 0 126 0 0 9 0 129 0 0

7 chithra 7 0 30' 180 0 50' 2 0 43 'S 6 0

40' 180 0 2 0 S

Range

Panchasidhanthika position 1 to 8 degree  
(Ayilyam to Punartham)

Polar longitude 32 to 180 degree  
(karthika to chithra)difference of 158  
degree

Polar latitude difference of 57 degree.  
'(between 3 degree N and 54 S )chithra and ayilyam

Suryasidhantha

Position 2.20 to 10.50(ayilyam to Karthika)8 degree 30'

Polar longitude 142.30 (between 37.30 and 180)between karthika and chithra

Polar latitude 7 degree S to 5 degree N (ayilyam and karthika)is 12 degree.

Suryasidhantha has zero at pushya (Karkitaka 93 degree 20 mt from Mesha zero at Lanka.)and Panchasidhanthika at Makham(Simha rasi 120 degree from Mesham zero)

Why Varaha took these nakshathra and was he deviating from vedic calibration of calender?There are certain stars which are prominent in winter nights and others in

summer nights for calibration of a star calender. The most preferred and the most ancient method was to look for the first and last appearance of Krithika(pleides) in India called the 7 sisters and mother Goddess saraswathy , and in other cultures as kabirim . In India karthika has the same role of yasoda(foster mother) to Krishna to subramanya, son of sivaparvathy.

The second was by looking at the heliacal rising of sunaka , the double dogstars for the seasons to come, and it is a saamaveda tradition of rishy Dalbia in chandogya Upanishad. Any year which starts from heliacal rising of Sirius or dogstar was reckoned. Now alpha ursae minoris is pole star or polaris and precision was calculated by looking at saptharshi in relation to pole star. In 3000 BC it was beta ursae minoris and in CE 14000 it will

be vega, Equinox and solstices shift with respect to background stars. The equinox move in opposite direction to the yrly course of sun. Suns position in among vernal equinox stars was an indication for vedic Indian for the state of precessional cycle, The equinocal sun occupy each zodiacal constellation for 2200 yrs. Around 5000 BCE it was in Gemini. Now in Pisces. In each nakshathra sun spends roughly 1000 yrs. The lunar calendar starts with krithika where the spring equinox was situated during Atharvaveda period. The 13 and half nakshathras from there to visakha are devanakshathras in north hemisphere, and the rest upto bharani are yamanakshathras in the southern sphere. yama is a twin star. Maithrayaniya brahmana refers to winter solstice at beginning of sravishta and

summer solstice at midpoint of Makha. vedangajyothisha was at beginning of sravishta and midpoint of aslesha.or ayilyam.Visakha and karthika are 180 degree apart ,Makham and dhanishta are 180 degree apart,Chithra and Aswini are 180 degree apart ,Ayilyam & Thiruvonam are 180 degree apart. Punarvasu and Uthraashadam are 180 degree apart and one is positive ,the other negative(sin cosine function trigonometrically) and if one knows the sin one knows the cosine and balances them and hence these vedic references and the different observations of different scientists(astronomers of the time)are explained by Varahamihira in a unifying way just as any modern astrophysicists would attempt to do.To look for elementary mathematics in a postgraduate text was what Thibout was

doing in Varahamihira's text and that explains the comment that Varahamihira doesn't speak of the Ptolemaic or the early Greek sidhantha and hence he doesn't know it and he knows only the unscientific almanac making etc etc.

Position ayilyam /karthika

Panchasidhanthika

8 .0 30' Suryasidhantha

8 0

Polar longitude difference

Karthika/chithra 158 0 142.030

Polar latitude difference

Chithra/ayilyam 3 0 N and 54 0 S

57 0 Ayilyam /karthika

12 0

Suryasidhantha takes karthika in all the 3 measurements as one of the factors of measurement in true conformity with the vedic Krithika ayanamsa. Position and longitude difference between Panchasidhanthika and suryasidhantha is 30 mts and 16 o 30 mmts respectively. That is the place of calculation is only 16 degree different for these two systems on same longitude. But the latitude is different. For Varahamihira it is between 3 degree North and 57 degree south. (chithra and Ayilyam) and karthika in North latitude is represented by chithra at 2 degree 43 mts south latitude, whereas suryasidhantha sticks on to the old 3 0 10 mts karthika position. Makha and Pushya with difference of 24 degree (23 degree+ mts between them allowed) is taken as zero point by the 2 systems. Which is for

the declination of earths axis. So in reality both are having no difference of opinion in methods but the observational changes from 2 different latitudes. One from a very south one, the other from an equatorial (3 degree N). 57 degree is the difference between these two latitudes if both systems are taken together.

This is just a trigonometric function of sine cosine.

$$2 \pi \text{ rad} = 360$$

$$\pi \text{ rad} = 180$$

$$\pi/2 \text{ rad} = 90$$

$$1 \text{ rad} = 180/\pi \approx 57.296^\circ \text{ (roughly)}$$

Actual is  $57^\circ 17' 44.8''$

Thibout has not understood this while he wrote the commentary. And so he says why these 7 stars alone and it may be

because the book is incomplete or because of inadequacies of the Indian astronomical system itself.

The preface of Thibout then says just before giving rules for the rising of Canopus (Agastya) are 2 sets of rules given in text. The first set is for calculating the heliacal rising of planets in one ahargana. venus, Jupiter, Saturn, mars, and mercury are given. The second set of rules is to calculate the sidereal motion of these planets sidereal revolutions and the poornagrahayoga are then compared for each. The rule for mahayuga are related to this calculation, he rightly observes. Upto this he says he could comprehend.

The true position and true motion of planets and stars are given from the apparent motion and position calculated

so far, and Thibout cannot explain them. He says the exact translation of dwivedi is without understanding the significance of the rules. He could not comprehend the rules for mars, Jupiter and especially for Mercury, he says. In 42-53 slokas of 18th ch it is said that mercury because of his position near the ecliptic of a strong planet (sun) has some special rules for determining its motion and position. But it is not comprehensible to Thibout, he himself says in his preface,. This is something which attracted my attention when I read the book . The book was translated when Einstein was a child of 10. And The rule for Mercury was first discovered by him when he explained the Theory of relativity. The sheer beauty of that thought made me delve deep into the subject . The modern view that

Mercury's special law of movement was unknown upto Newton's time and Einstein was the first to discover it is wrong ,if we study Panchasidhanthika of Varahamihira, written in AD 4-5th century India and this fact was noted by Thibaut while Einstein was a ten year old boy!! Varahamihira was a scientist ,not a almanac maker,almanac making is only a part of Astronomy ,and this is very clear from the text of Panchasidhanthika and its scientific outlook.But ,I feel many of the past as well as present historians,astronomers have not paid much attention to him or to his books.The rules for planets are given from both vasishtasidhantha and poulisa sidhantha and a comparison given ,so that the comparative planetology was known to him is very clear.

Now, coming to the interpretation of the observations as given by Thibout:- There is a preformed notion in him that Hindus could not have done these prior to Greeks and he mentions this several times in his commentary which seems very absurd from a scientist/objective analyzer. The knowledge of planetary motion, length of day, structure of universe etc are illusionary and incomplete for the Hindu astronomers ,he says. Because the panchavarsheeyayuga adds saka 2 to it, he even thinks that the Paithamahayuga (which he himself says is ancient as vedangajyothisha or even before that) is written in saka year 2. He says the lunar calendar of India is unique in that it is seen nowhere else in the world and it was very much evolved during panchasidhanthika. These 2 opinions do

not conform. He doesn't give Vasishta sidhantha and Paithamahasidhantha much credit because he thinks they are anterior to Greek systems and hence totally unscientific. (preformed opinion that everything prior to Greece is unscientific cannot be scientific!) The other 3 sidhantha (poulisa, Romaka, and surya) are scientific but they are totally under the influence of Greek science. (according to him) But he cant understand why suryasidhantha does not agree many findings of Romaka and Poulisa. The kalpayuga of Suryasidhantha is conventionally Indian. Romaka has a definite lunisolar yuga and he didn't know any other planetary position or comparative planatology, and accepts Ptolemy's geocentric calculations verbatim so that it is the only scientific

theory which knows Ptolemy's modifications ,he argues.Varahamihira was totally unaware of Ptolemy and the science of the Greeks according to Thibout.The vasantasamarathra was in aslesha ,and its position in Punarvasu in his time means nothing to him,Thibout conjectures.He didn't know anything about ayana change or of revolution of Khagola,Thibout says.What a discovery. Just before this sentence ,he had been dealing with the rules of planetary revolutions and ayanamsa as known to varahamihira and then suddenly switches on to say that varaha didn't know anything of these.The very fact that none of the old Indian sidhanthas accepted the geocentric Ptolemaian science and were very sure about motion of planets around the sun shows that they knew true

principles of astronomy and mathematics while ,Ptolemy was repeating what was taught to him as a beginner ,by the teachers of Sind .When you first start learning astronomy ,you have to learn the geocentric universe,observe it and make your own calculations.Only then you proceed to next stage.Ptolemy was in the junior kindergarten stage as far as the Indian teachers were concerned..And every other astronomer in India knew it.The words Yavanapura and Romaka are due to similarity in pronounication and due to common habit of calling the Greek the yavana ,have made some confusion.(Thibout has this confusion from Wittney )For India,Yavanapuram was not Greece alone.The Assyrian,Babylonian,Egyptian also were yavanas.The word Romaka does not mean

Rome, but Roanake island and Romakapuram or Atlantean islands which according to all Indian scriptures is the abode of Maya , the great architect and the father of Mandodari, Ravana's consort. Lanka and Atlantic Romakapura had connections from antiquity. (Athalam of Indian scriptures is the modern Atlantic)

Thibout categorically rejects the idea that the Indians (including varahamihira) knew anything about the scientific astronomy of Greece after Ptolemy , and not even the astronomy of the syntaxis which is very different. At the same time he says they have borrowed from Greece and Rome. Then he adds , since we don't know anything about the astronomy before Ptolemy in Greece , it is difficult to form a

definite opinion but he will give some hints.

1.Lunisolar rules were first described by Hipparchus and Ptolemy accepted them verbatim and said that they were his own discovery.

2.Any Hindu astronomy text should be placed only between the era of Hipparchus and Ptolemy.

3.Anomaly of apsis,of conjunctions etc if we find in a Hindu text ,we have to assume that it is from Ptolemy ,because Ptolemy claims that he was the first person to discover them.

4.moolaromakasidhantha might have been a purely lunisolar one based on Hipparchus.

5.To make a calender one need only this and hence almanac makers of India

borrowed them from Hipparchus and Ptolemy.

6.Rome and its civilization was famous one century before Ptolemy ,so that,we can say Romakasidhantha was one century older to Ptolemy.

7.The rules of poulisa may be before Ptolemy.

8.Knowledge of astronomy from Greece came to India not through scientists,but through the crude almanacmakers of Greece.The difficult mathematical calculations were omitted by the Indians since they could not cope with complex maths .!!!!

9.This explains why even after borrowing from Greece the Indian system is so crude and unscientific and differ from syntaxis.

10.If at all there is an individuality it is for the old suryasidhantha of India.(but as we saw all the sidhantha accept only this individuality and not that of Ptolemy !)

11.Aryabhata was just one another astronomer who followed suryasidhantha and this was known to varahamihira.

12.Lata was younger contemporary of Aryabhata and lived in AD 505 so that Romakasidhantha is before that,since Lata has written a commentary on it.Romakasidhantha is probably in 400AD,

13.In 13th ch varaha states the shape and revolution of earth on its axis as an old concept ,and doesn't say that it is the discovery of Aryabhata.It is there in all the 5 sidhanthas described by varahamihira.

14 Then why was Aryabhata so famous remains a question.

15.In suryasidhantha Revathy yogathara is zero longitude and Aswathy one degree mesha.Since it was in 572 AD in vasantasamarathra Hindu astronomy is only that much old.(He just forgets a cyclical system in which the combination comes again and again for several yugas in long periods)That is why varaha gives piscium zero degree longitude.Aryabhata is silent on this.For Greece Mesha one was vasantasamarathra and not a fixed point for zero.

Without any commentary on these hints which he gives one can understand that there are lots and lots of ambiguities in Thibout's views.Still they are being perpetuated by our text books,our media,teachers,books and even by Internet sources without proper research or thought into the whole process.

The quote from 33 Wikipedia is given here as an example.:

### Western influences

The Romaka Siddhanta ("Doctrine of the Romans") and the Paulisa Siddhanta ("Doctrine of Paul") were two works of Western origin which influenced Varahamihira's thought.

A comment in the Brihat-Samhita by Varahamihira says: "The Greeks, though impure, must be honored since they were trained in sciences and therein, excelled others...." ("mleccha hi yavanah tesu samyak shastram kdamsthitham/ rsivat te 'p i pujyante kim punar daivavid dvijah" (Brihat-Samhita 2.15)). The concept that Varahamihira was influenced by Greek was first introduced by European

enthusiasts including G. Thibaut who attempted a translation and commentary of Panchasidhanthika with the help of Sudhakara dwivedi, and this book came out in 1889 (while Einstein was a child of 10). The yavana in Varahamihira includes a broad term, including the people of Romakapura and Kethumala (modern Guatemala, and central Americas) and Chethumal bay. The calculations he gives were unknown to Greeks or to the Europeans. He gives the rule of variable hypotenuse for theorising relativity principle and uses Fibonnacci series, Gregory/Neelkantha/Madhava series and the modern Euler's concept in his calculations and these can be traced up to the time of vedic mathematics. The keplers and Newtons law and the energy number of Einstein were known to him,.

and all these are done with least complicated mathematics for common people and a very complex mathematics for the initiated one. The waterclock which he describes is totally different from the Greek water clock, and uses the principle of Archemedes (before Archemedes was born). Dr Suvarna Nalapat has dealt with this book and its importance in her book, *Rediscovery of India*

through Varahamihirante panchasidhanthika. (NBS Kottayam. first ed 1991 October, second ed 2000 January33) Some important trigonometric results attributed to Varahamihira

(See UGC India Science vol 292 .No 5514 pp27(2001)(ref34 )Sanctioned Jyothisha also.This trigonometric formula,computation of sin tables with accuracy using new interpolation methods,problem of computing by Pascals triangle for finding binomial coefficients, and magic squares (pentagonal) of order 4 in his work are mentioned in that reference)

citation for Einstein and Archemedes. The rule of Mercury ,I have already mentioned in the abovementioned article for the Citation of Einstein and his laws.The citation for Archemedes remains.Ch 14 sloka 31 and 32 describes the ghateeyantra or waterclock .

Make a half kumbha(vessel)with Thamra metal so that it is very very thin and make a small sushira or hole with a metal needle so that ,if put in a vessel with water,the water drops enter from bottom ,and fill the small vessel and sink it.The thinness of the vessel and the size of the hole should be such that ,60 times of sinking the vessel is a naadika.It is also the time taken to read 60 slokas with 60 aksharamaathra and is related to a man's praana or breathing.1/60 parts of water enter the vessel in one naadika.Thus the ghatteeyanthra connects praana(breathing and yogasasthra),chandas(musical)and Archemedes principle to Astronomical measure of time and the making of such an equipment needs some special skill in mettulurgy and knowledge in mathematics.This waterclock is also

described by Vyasa in Bhaagavathapuraana(ref 35) which is written in /or before 3104 BC.(Well before Archemedes).Thibout says Syntaxis is related to astronomy ,music ,grammer etc of Greece and such relation is not there for Indian scince of astronomy ,but this sloka is on the contrary showing a very very interdisciplinary approach more advanced than syntaxis ,because the grammer,chanda and music of Indian Sanskrit were more advanced than Greek.The samaveda concept and yoga concept of the east had nothing in parlance in the west and a science using an interdisciplinary approach like that was not there in Greece ,as well shown by Archemedes and his discovery which happened in say,500 BC.But,veda and the science of astronomy were more anterior

to that .And varaha was just describing the instruments used for astronomical observations ,not saying that they are his inventions.Whatever he says does not belong to his period but to ancient period.In Bhaaghavathapuraanam also the making of Ghateeyanthra is given just as given by Varahamihira.Hence the process of floatation and sinking a ship was there just as the Archemedes principle in this ghatteeyanthram in seafaring people of India who made use of the monsoon trade routes(Ref Mooshakavansakaavya)36.It was this which attracted the Greece and Roman and later on Portuguese ,and British.It was not the other way round.Coming here and learning new things ,probably they felt a new impetus and whoever got a scrap of fragmentary knowledge started to say

that I invented this ,this, and this. And that continues even now. A water clock of Greece based on floatation principle does not have all these complicated interdisciplinary approach which everyone can verify. It is given in all encyclopedias . ( refer 37 Innathe amma or today's mother by Dr Suvarna Nalapat Balasanskrithy kendram Alwaye)

## PANCHASIDHANTHIKA

In ch 1 Karanaavatharam Sloka 2 says the aim of the book is to describe Bheejaganitha which was done by the ancient astronomers of India and which have become extinct and known only to

very few during Varahamihira's times. The sphuta is the seed or bheeja which is very subtle, deep and magnificent. It is not just calculation. But observational data brought under mathematical precision. The differences in observed data, in calculations by different people in different places and different times have to be synthesized and analysed in under scientific methods and only then we will understand that there is no discrepancy but only relative differences due to relative position, timespace etc.

What is the opinion of Bhaskaraacharya about Bheejaganitham? Bheejaganitha appears like a secret knowledge but it is not secret for the intelligent. Ganitha or calculation is not 6 types, but several types. Bheejaganitha means pure intelligence.

Sloka 3 gives us from where or from whom the 5 sidhanthas originated. In the sacrificial hall of great sage Garga ,Sage Pulisa once heard a discussion on Astronomy between surya and Aruna From what he heard ,he wrote his treatise Poulisasadhantha.(varahamihira does not say that Poulisasadhantha is that of Paul, but of Pulisaacharya.) The important fact is the discussion happened in the sacrificial hall of Gargaacharya, the sage who lived in vedic times and whose view of the universe or multiverses is more beautiful than the most modern cosmologist's view.(Which is given in Gargasamhitha). The astronomer Surya had to be born due to a curse of Brahma in Romakapuram, and from there for education of the yavanas of Romakapura, he created Romakasidhantha. Leave alone

the rebirth theory ,and just look at the key figure surya who took part in the discussion in Gargya's assembly of scholars.The same person had to be in a foreign land ,may be due to some trade and commerce or just for the sake of learning and calculating the astronomical data on the other side of the globe, and it was he who did Romakasidhantha. So ,the period of Poulisa/Garga/Romakasidhantha of Surya are not recent.All of them are vedic period treatises but with slight differences of opinion between different scientists as it occurs today also.Vasishta got his theories on astronomy from his father Brahma,during the time of creation, and then he passed it on to his son Paraasara. This is followed by his son sakthy, grandson Parasara,great grandson Vedavyasa and was known from

Krithayuga, lasted through Threthayuga (Vasishta being kulaguru of suryavansa) and Dwaparayuga through Garga(kulaguru of yaadava)and vyasa(guru of the kuru dynasty).It is the same as the vedanga jyothisha of Brahma or the vedic knowledge carried over millennia to successive generations and is called Paithamahasidhantha since it belongs to Brahma,the pithamaha of vasishta lineage.Surya had given Romakasidhnatha for Romakapura people as an educative process ,and had suryasidhantha for the Bharath people.They are two books by the same person written for two nations or two people according to their knowledge in subject and the relative position in spacetime. Suryasidhantha was modified as modern suryasidhantha during the period of Aryabhata. And this modification

had its own questions and doubts to be cleared and Varahamihira's brilliant account and scientific treatment of astronomical data of all the 5 sidhanthas with comparisons and differences between them shows how scientific a mind he had about the whole process. Sloka 4 tells us the oldest is Paithamaha sidhantha of Brahmaa, next in chronology comes Vasishtasidhantha, the son of Brahma, The third one is poulis sidhantha discussed by Surya and Aruna in Gargamuni's yagna and written by Pulisa who heard it, and finally the Romaka and Suryasidhantha of Surya for Yavanas of Romakapura and for Indians. Poulisa sidhantha is a heard treatise, Romaka sidhantha is a teaching for the beginners, suryasidhantha is a modern version of vedic knowledge made by surya in India ,

and is very accurate. The other two are the basic sidhanthas on which all the sidhanthas of surya ,Romaka, and Poulisa are based upon.

5th sloka is very informative as it says the bheejaganitha method of secret knowledge which has baffled the minds of Thanthriks is the knowledge of graham Bhanu (Bhanu is sun) and he will discuss it thoroughly. Why Graham? Why did he use such a term instead of a star? Is not sun a star? Did he not know that basic thing? The word meaning of graham, in sanskrtit , is one which makes you grasp the movement of another celestial body as a coordinate. It doesn't have a connotation of English word planet . We have to know the relative and coordinate movements of 9 points in space to understand or grasp the sphutasthithi of a

10<sup>th</sup> point in space. The Sun as a central point ,we have to study the movements of 9 points around it to know its position. Likewise to know a zodiac, one has to depend upon 9 points in space .sloka 6 and 7 gives us a list of topics discussed in the book which includes the directions, spacetime and true position, the measures of geodesics or karna, the periods of the eclipses, the conjunctions of stars and planets for observation from earth, the differences in latitude and longitude ,the zero degree longitude /latitude crossover point and its lambda or 90 degree vertical line, the rise of moon and its samamandala or equal nights, the construction of various astronomical equipments for observation, gnomonic calculations, the arc of the latitude, the other arcs, and the reverse movement which is apparent etc .

Then ,in sloka 8,9,10 he gives a general rule of how to calculate the total number of days elapsed in a particular year.This he gives for easy calculation.

The method given,when I applied to 1987 March 16th (1909 Chaitramaasa 2nd) I got like this.

$$1909-427=1482/12=123 \text{ Remainder } 6$$

$$7 \times 6 = 42/228 \times 30 = 1857 + 1 = 1858$$

Make to 2 positions by adding

$$1+8+5+8=22$$

$$2 \times 11 = 22$$

$$514+22=536$$

$$536/703=0.71 \quad 367/703$$

$$1857-0.71=1857.29$$

This can be written as

1. 18500000

72000

9

2. 18000000

570000

2000

9

3. 1800

57.29

180/Pai is 57.295878 approximate which is a rad.

This means varahamihira was giving value for a angle subtended by a section of circumference equal in length to the radian, the radian is such that

2 pai rad=360

Pai rad =180

Pai/2 rad=90

$1 \text{ Rad} = 180/\pi = 57.29578$

Or  $57^{\circ} 0' 17'' 44.8''$  which is the same as the modern value for rad. In other words when the Indian astronomer is counting the number of days in a given epoch he is actually calculating the rad as well. When we say so many days have passed in kaliyuga, it means so many rads have been measured by the solar days and earth .

How do all the sidhanthas conform to Paithamahasidhantha the oldest one in this calculation?

Panchavarsheeyayuga of Paithamaha has 366 days .

$366 \times 5 = 1830$  days.

$2850 \times 366 = 1043100$  instead of 1040953

2850 into 12 solar months = 34200 solar months This + adhimaasasankhya =  $35250 \times 30 = 1057500$  chandradinam

minus thithipralaya  $16547 - 1040953$

Difference of 2147 days Or 5.8 yrs.

In 19 yrs  $5.8/2850 \times 19 = 0.039$  difference

Which is the 3 starboundary according to Indian concept divided by 1000. This minor difference is due to relativity of different celestial bodies. In the case of earth, moon and sun, the difference is neutralized by itself every  $19 \times 150$  years = 2850. You don't have to add a day or minutes a day from the days elapsed, just watch and modify on the existing data by applying bheejaa.

2850 of Romakayuga is thus derived from Paithamahasidhantha, and the 19 of Meton also is from Paithamahasidhantha, or indirectly from the old Romaka sidhantha.

7 adhimasa for 228 days is obtained by Romaka by applying the rule, and the fraction 11/703 for making thithi or chandradina to solar days (703 lunar days with 11 varjitha, so that in 1057500 lunar days one get 16547 varjitha)

The same figure 703 is used by Poulisa sidhantha also without giving how they got it.

Why 150? Because it is Raahumaanam and the time for 3 parispanda (change in position) of the dogstar Sirius which was measured as early as the samaveda period in India.

Thus,we know the derivation of the figures used in calculation and how all of them were using the vedic numbers of Paithamahasidhantha .

Sloka 12 gives a rule in which Rithusapthanava plays a role . This means 976 in kharoshti.

Sudhakradwivedi gives 976  $4334/66389$  to get solar and lunar days. With  $36389/180000$  he gives 13 fractions

$\frac{1}{2}, \frac{1}{3}, \frac{3}{8}, \frac{7}{19}, \frac{45}{122}, \frac{97}{263}, \frac{142}{388}, \frac{2}{39/648}, \frac{859}{2329}, \frac{2819}{7635}, \frac{685}{9964}, \frac{13}{841/37527}, \frac{17516}{47491} (0.5, 0.33, 0.385, 0.36, 0.36, 0.37, \dots\dots)$

For lunar days he also gives fractions 63  $63379/69673 =$

63,64,63  $10/11, 63 141/155, 63 292/321, 63 433/476, 63 12416/13649, 63 12849/14125, 63 25265/27774$

And then compares the figures in soura and Romakasidhantha upto 15th sloka. The souramaasa of Romakasidhantha

multiplied by 61 1/59 gives souramaasa of sourasidhantha.

Sourabda of Romakavarsha multiplied by 63 3/59 gives sourabda of sourasidhantha.

	Surya	Romaka
Solar months	2160000	34200
Adhimasa	66379	1050
Chandramasa	2226379	35250
chandradinam	66791670	1057500
Kshayadinam	1045095	16547
Saavanadinam	65946575	1040953
sourabdam	180000	2850
Nakshatradina	65926575	1043703

Number 5040 which is the LCM of 45 and 112 of Poulis sidhantha .

$X 570=2872800(5040 \times 19 \times 30)$  is 22800 different from 2850000.

In 22800 yrs adhimasam of Romaka sidhantha  $22800+700=23500$

$5040 \times 30=151200 \times 2=303400$

$302400-287280=15120$

$1800 \times 190=342000$

The solar yrs of suryasidhantha/ $100 \times 190=$   
solar yrs of romakasidhantha $\times 10$

$1800 \times 1200=2160000$

$1800 \times 1900=3420000$

$1200 \times 1900=2280000$

$1800 \times 1800=3240000$ (SAMAMANDALAM)

$2160000+3420000=5580000$

$2280000+3240000=5520000$

$$5580000+5520000=11100000$$

According to Asthaau vedachakshushi angachandramasaa the naabhasayoga sankhya are 8,24,32,32,27,30.The LCM of which is 4320.(2160+2160 as samam)

In Hora varahamihira says the naabhasa yoga were converted by the yavana as sama of 600 multiplied by 3.He says that is for easy calculation but the actual is not that simple as the karna or akarani are there to be looked into.The universe is not a square, and its karna are not of the same size as the yavana think he states.In other words he is stating that Indian astronomy is not geometry of the flat earth or the science of mapmaking alone as the yavana have misinterpreted it ,but it is bheeja ganitha or pure intellect or science of a higher nature.

Coming to the star measures of soura and Romaka,

$66379+180000=246379$  for soura and  
 $1050+2850=3900$  for Romakasidhantha  
nakshatraparimana of Soura/that of  
Romaka= $63\ 679/3900$

between 63 and 64 the two ganitha  
become one. For Indian astronomy  
nakshathraavadhi is  $13^{\circ} 0' 20''$  Romaka  
avoids mts and multiply with 3 to get  
39. For 300 stars it is 3900

If we consider the mts also for 300 stars it  
will become 4200

$246379/4200=60.1518\ 17/21$

One sidhantha use  $63\ 679/3900$ , and  
another  $246379/4200$

The quotient is poornabhrama and the  
rest or balance is nakshatraparimana in

both.679,151 etc are for the node or Rahu or the earths orbit used by Indians.

For 2850 yrs the grahayogamasa of Romaka is 1175. For Paithamahasidhantha it is  $18.95 \times 62 = 1174.90$  which is equal .

## Chapter 2 Panchasidhanthika

sloka 1 is not understood by Thibout and Dwivedi alike . Dwivedi says *Anena slokena kim saadhyatheeethi na gnaayathe.*

It says if we multiply 6,8, and 1000 with 4 we get 24,32 and 4000. If we multiply 9,9,8,65 with 10,3, we get ,90,27,80,24,

60,18,50,15 respectively and the sum is 364. In Hora, Varahamihira while talking on Parasarahora and the highest point of sun and earth, speaks of this rule. The first sloka is the raasipramaana of Hora. Multiplying 5,6,7,8,9,10 with 4, one gets 20,24,28,32,36,40 which is 180. The alternate numbers 24,32 and 40 (X 100) are given in first sloka first line here. Last line gives 36,36,32,24,20. Except 28, all numbers of raasipramana given here. If we draw the raasipramaana as given by varahamihira what we get is the vishama vritha of earth's orbit around sun. (not samavritha) As we know it is the kepler's law. And the periodicity of the numbers is related to musical rhythms which we will discuss later.

Then Thibout says sloka 2-6 are the rules for determining position of moon

accepted by the Indian astronomy and that he could not understand them.

What is measuring longitude and latitude in modern terms?

Meridional angle between any two points ,from the difference in time at which some celestial body crosses over the celestial respective meridian is measured,( that is ,pass through the celestial meridian) The intersection time of the celestial sphere and extended planes that define meridians. For this we use a star, but not the sun,because of the complication caused by the earth's orbit or the raasi pramaanam just mentioned. Indians used 27/28 stars as ref points.

The rule given is

Ahargana+1936=sum/3031=one ganam

Balance  $X 9/248$ =one gathy balance padam.

185/gathy and subtract  $1/8$ th of gathy to get kala.Padam  $X 124 +1/2$  of gathi . Subtract result from padam.you get the beforesaid third khanda.

To see padasamgna /124 and get balance padasamgna ,add to the 4 liptha, $1/2$  bhagana each to each  $\frac{1}{2}$  gathi.see both positive and negative values .Reduce 1 from padam.multiply with 5.Add 1094. Reduce from 2414.balance multiplied by balance pada is divided by 63 to get kala. Add the kala to the already obtained mean moon ,you will get the true moon .

The 63 or 64 sometimes used as the last step in this is actually the R or the multiplication for the angle in radian which is nowadays used as 6371 KMs (for

computing surface distance)  $248/9 = \text{time}$  for one anomaly rotation which is 27.6. That is why only 27 to 28 stars are calculated. 3031 is a gana time for 110 anomaly rotations.  $27.3 \times 110 = 3003.0$  which is  $3031 - 28$

The fractions used for are  $1/9$  to  $247/9$ . Pada more than 124 is varjitha. When we do the varjana add  $\frac{1}{2}$  gathi to gathi. From mandocha to sheeghrocha in  $124/9$  days  $\frac{1}{2}$  gathi movement happens That is in 13.7 days. Or roughly 14. 14 days is half the globe or 180 degree and 4 minutes for moon. For one degree it is 4 mts and so for 180 degree it is 720 mts Varahamihira here says 6 raasi and 4 mts which is exactly this value. (724 mt) In fact different sidhantha take 720 to 729. (divisible by 8, 4 and 9 the multiple being  $8 \times 4 = 32$ ;  $8 \times 9 = 72$ ;  $9 \times 4 = 36$ ;  $4 \times 8 \times 9 = 288$ . All these are used by

Indians in their astronomical and musical/mathematical compositions) In this way one gola is not 1440 mt but 1448 mt or 360.8'

648000 mt =10800 hrs=450 days=30 lunar months

But 648000mt is  $2880\text{mt} \times 7 \frac{2}{3}$  times

$=2880 \times 23/3 = 960 \times 23$

=22080 mt

=368 hrs=15 days 8 hrs. In this way, lunar, solar and earthly time and distance and movement are computed and the values checked with observation or bheejaganitham.

For every 270 degree 6 mts increase makes 60 mts for 2700 degree.

2700 =225 raasi which has a perfect square value

That is  $2700 = 225 + 15$  is the pinda when converted to timescale become  $2880 \times 7$  and  $2/3$

648000 is the unit of time. It when multiplied by 100000000 becomes the units of energy.

This calculation of Varahamihira is for conversion of mass, movement or gathy and energy into each other.

Why 30 and 27? Why 39-40? Because the background radiation or energy comes to us when the universe is 300000 to 400000 yrs old (when the cosmos was permeated with sound waves or the waves with frequencies, or Naadabrahma) and comes to us as red shift as in Betelguese ( Thiruvathira ) or Mars. and has a blackbody temperature of 2.7 degrees The oldest light in universe in a

skymap is still 380000 yrs for the modern astronomer but several of such had passed in cyclical kalpa and yuga of ancient astronomers.

In flat geometry it is 73 percent dark energy for moderns and 72 for old astronomers.22 percent dark matter for both,

We must remember that during Romers time C had a value of 225000 ,which is the value of prathamajeevan or first jya of Indian astronomer X 1000.

If we use  $E=mc^2$  with  $M$  as 720,  $c$  as 300000 energy value is 648000000000000  
1/9 of 648 is 72.

Indians used 22.5 as well as 30.0 as the value . Einstein used 30 and Romer used 225.22.5 is the shortest distance possible for a satellite of earth and therefore

Indian astronomers called it prathamajya or the first jya.

The most important thing is that Varahamihira in this chapter states that the calculations are taken from Vasishta sidhantha for computing gnomonic lagna and chaya and for longitude latitude distance and time calculation. Thibout thinks vasishta has not borrowed anything from the scientific Greeks and he is very unscientific !!! (But what Vasishta calculated was scientific and correct. ) Lunisolar era and earth related clock by exact measurements, the heat of the sunray from a polished brass mirror at noon to measure the power of Agneyaasthra were known to Indians (To Vasishta,to Paithamaha, and to Kashyapa mareecha of the vedic period) .When the calculations are given ,we have to

correlate them carefully and compute with literary ,sources as well.

Every Indian system knows of the saayana and nirayana of the universe.In one year the saayana is only 0.136,36,36,36.....a recurrent decimal which is known to parasara,vyasa,paithamaha,vasishta and suryasidhantha .Since it is Only 0.1 and the rest is recurring decimal, it is as good as an inertial nirayana system of coordinates. In ch 3 sloka 12 varaha says that the charanaadika rule is one which is followed from saagara to Himavan, all over India, and even after such statement to say that it is borrowed from Greek is intellectual slavery.The sum of the opposite chararaasi is 704. It is not a rule from Paulinus or any other foreign astronomer.

It is after stating this Indian rule that varaha says in the 13th sloka how to find from this rule the distance from yavanapura and Avanthy. Which clearly states he is using an Indian rule of measuring distance on globe and applying it to avanthi and yavanapura. And hence the 7 and  $1/3(7.20')$  as desantharaghata of Avanthi and 9 as that of varanasi.

For one degree 4'rate for 7 hrs 20' or 440 mts the difference from two points is 110 degree. From Avanthi 110 degree distance lie Tula in Mexico and it is the yavanapura of Varahamihira.

SI 15 tells us if the zero degree is Ujjain (instead of Lanka,) from there to any place X the yojana is to be converted to degree as

$$3200:360=\text{yojana}:X$$

$x=360Xyojana/3200$

Being a gola ,the distance between ujjain and X on earth is the karna or radian .The other two sides of the triangle being the parallel drawn between the longitude of ujain and X and the difference between these two places longitudes in yojana.

$(Karnam+1)-2=\text{phalam in degrees}$

$\text{phalam}/6=\text{Naazhika}$

Half of this difference in longitude is minus in northern hemisphere and plus in southern (Thibout)

Decrease in poorva (east )and increase in west according to text..

The next sloka deals with the jya .The jya has 800 kala as a starlimit ,varahamihira says.Reduce the longitude of moon from that of sun Then you can see the time of the moon reaching a star according to the

ratio of movement of the moon. By the ratio of difference between movement of sun and moon we get the thithi.

SI 17 gives the monthly movement of sun from chaithram to 6 months and for the next 6 months as different which clearly shows that the ancients knew the orbit of earth not exactly circular but elliptical.

The total thus obtained is 708 according to this calculation. (see the sum of opposite chararasi as 704 in another sidhantha in sl 11 )

Then the vyatheepaatha rule which is given in Paithamahasidhantha , is given according to poulis sidhantha. It is the same rule showing that he had learnt it from the Garga university .

SI 21 states that when the sun who is very hot starts utharayana ,the suryavritha or

the orbit has its orbital bindu or earth in the middle of Ashlesha and at that time the fall happens. And the ayana corrects itself. We don't have to add anything to make it correct itself. It is a natural phenomenon. At this time, (when he writes the lines) the ayanam is in Punarvasu.

This shows varahamihira's scientific turn of mind but here also Thibout just says that varaha does not seem to know the secret of the precision of equinox.

The rule actually is derived from paithamaha, parasara etc which considers the difference per annum as 0.136,136.....degree.

In 366 days 0.136 difference

To get one degree difference  $366/0.136$

For 180 =  $366/0.136 \times 180 = 484.411$

Or 485 which in kharoshi is 584 the venus movement.

484.411ame is 968.822 whereas 485 added to the same is 970. And within these periods 360 degree. Or one complete revolution. By 76 years a man see 960 fullmoons. And this 76 is the timespan of one Dhoomakethu which we now call Halley's comet. The ansa of Rahu is aharganaX8/151. To this add the full revolutions. A point which moves 8 degee in 151 days takes 6795 days for full revolution. If ahargana is 2850

$$2850 \times 8 \times 300 / 151 \times 12 = 570000 / 151 (57 \text{ is the value approximate of one rad in trigonometric function.})$$

=3741 balance 109

for one rasi 1800kala and 1/8th of it is 225 prathamajeeva or first jya,

In 151 day 225 kala

In 1 day =  $225/151 = 1.49 + 1/151$

To 12 rasi or 21600 kala

$= 151/225 \times 21600 = 14496$  days

$366 \times 40 = 14640$

$14496 = (366 \times 40) + 144$

$6796/366 = 18.1$

$2850/151 = 18.8$

The number 6796 which Romaka and Ptolemy use is thus related to & derived from Paithamaha.

Romer's time 225000 km /sec used and according to this the  $E=Mc^2$  is

$225 \times 225 \times 720 = 36450000$

Twice that is 72900000

Which is pindasamkhya( $720 \times 100000$ ) and urjasamkhya(900000)

By 8 revolutions of apakramabindu the sayana /nirayana difference is neutralized . In sloka 33 varaha says *swavishayabhothaashtarasairabdai*

1,5,8,5 added gives 19. This multiplied by 4 =76 and in 76 yrs *pasyyaasya vyatheeapaatham* or one can see the fall of the comet (from the Thamograha) as a Dhoomakethu (currently called Halley's comet).

Sloka 35 requires mention because he states about relativity of time here. He says in both smrithy and sruthy time is mentioned as relative and even if scholars quote it, many does not know this

The 30 raasi of Indian is also the light travel of 300000 km per sec which takes

8.8 light mts away sun (as per saayana ) and the distance of moon to earth is 380000 km to 390000 kms (which is taken as 39-40 in different sidhantha)and 39 also is the dasaamsa of amount of solar energy falling on surface reflected back to space. It is a fraction between 0 to 1 and earth's is .39 which means 39 % of light is reflected back. Within 1.27 sec light reaches means it is 1.27 lightseconds away which is taken as 120-128 in different sidhantha, and if we say 228 million kms away from earth there is a body ,that body will be 13 light units away. When we fix one star limit as 225-228 ,it is almost the same distance as mars to sun, and is a starlimit and the prathamajeeva or the light reflection during an eclipse. And we know that the Proxima centauri the nearest star is 1.3

parseconds away ,and so the number 13.20' for a star of Indians is based on the observation and calculation .

Now,you may ask the question ,did Indians have the ability to concentrate the sun's energy and measure it as the modern people do? The observation of eclipses right from antiquity was done through mirrors. The mirrors used were brass initially very well polished and these were used even to destroy enemy ships at a long distance by the Indian travelers (who are now called Phoenicians)and this was called Agneyaasthra.And Pythagorus had learned that such a thing is possible from the Indians and tried it but could not do it,because in Greece the technical skill of brasswork was not welldeveloped as in India. Especialy in Kerala where the seafaring people were many ,the mirror

and its polishing was a craft well developed. Every house had a mirror called a vaalkannadi and the Aranmula kannadi developed due to this ancient practice of seafaring. The stars close to us is measured by the method of distance through parallax. The approximate shift in position of star viewed from earth at least for one year. This was combined with esoteric methods like measuring the moving clusters. The ancients knew the star Rohini (Krishna's star) in Orion as a supergiant Thiruvathira , the star of Shiva having a red shift , just like Mars which also is red , for comparison, and watched the star Sirius or swaana with its dwarf for one year as seen in Chandogya Upanishad, by Dalbya the vedic rishi, and many other stars as seen in the scriptures. By the light travel time Indians learnt the

33 crores of Deva(shining ones or stars of heaven/sky etymologically,not Gods)Just as the new astronomers do.

Powers of 10 is a shorthand way of referring to very large numbers as well as very small numbers developed by the vedic Indians as all of us know.

Table of comparison of dasaamsa distance

Distance unit	kms	Light traveltime deva/shining ones
Light sec	$3 \times 10^5$	1 sec
Light mts	$1.8 \times 10^7$	1 mt
Astronomical unit	$1.5 \times 10^8$	8 mts

Light year	$9.5 \times 10^{12}$	1 yr
Par sec	$3.1 \times 10^{13}$	3.3 yr
Kilo par sec	$3.1 \times 10^{16}$	3.3 thousand yrs
megaparsec	$3.1 \times 10^{19}$	3.3 million yrs

Thus 33 crores of shining stars time was calculated and adjusted to that of earth's time. Powers of 10 allow for easy multiplication and division and powers can be added when multiplying and subtracted when dividing. And with this the ancients found out that the very large wavelengths and the very small ones are beyond human sensory perceptions and therefore what is seen and known by human intellect is only a very small fraction of what actually is there and thus

came the relative theory to them. Astronomy is a humbling pursuit. Our place in the universe is pretty small. We are encapsulated in an image less than a pixel wide. Within this tiny bit of space a solar system is formed complete with an inventory of different worlds and on one fractional bit of that pixel , generations of humans have lived and died .That is how large yuga and kalpa are known to Indians . I would like to describe what Rishi Garga describes in his samhitha.

Gargasamhita says beyond the universe which we know of are several universes of different sizes and one crore yojana above them is 8 cities or pura, and beyond that is viraja, the dustless place and thee we find Goloka which is equal to infinite number of suns emanating lightrays. He states that man who is in a secluded atmosphere of

his own universe thinks that it is the only truth .like a fly within a fruit.He says from the dark thamodwara the light flows to either side as brahmarasa and viraja the dark Krishna is dear to Vishnu /Krishna.It is not empty but full of light energy unseen by us.He describes Viraja as a river/sea with foam and bubbles in which Vishnu sleeps and plays.

When we read this and then read the description of a modern astronomer “The socalled empty vacuum is not really empty. What we call real particles are like the froths and bubbles of a sea of vacuum activity...particles are the bubbles and space is the underlying seawater.” What is the difference between old and the new,except the language?One is English,the other Sanskrit.I can only see that difference.

The description of vasishtasamhita is almost alike, but he describes the several universes as the size and shape of Abrus precatorius (of same shape and size) revolving without touching each other, while garga gives different size (shape is that of fruits and hence spherical and elliptical) like that of different fruit trees.

**Ch 4 is the karanaadhyaya** which gives the mathematical functions in detail. It starts with  $\sqrt{1/10}$ th of  $(\pi)^2$  is diameter. A circle of 360 degree is divided to 4 and then the  $1/8$ th of a rasi( $225'$ ) sine or jya is decided.  $r^2$  is the dhruva(pole)  $1/4$ th of it is Meshajya. Jya is lambarekha of latitude.

To see the other jyas take jyavarga (which jya you want, that chaapa or jyavarga)

Reduce it from 1/4th of the circle. R is reduced by the jya of the balance. Varga of half of this reduced R is added the varga of the first chapavarga's half's varga.

The squareroot of this is the required jya. From the fixed varga minus the jya and the varga of balance is kotijya(cosine) Half of sthiravarga is 45 and it is varga of 1 and a  $\frac{1}{2}$ . The R of 3 raasi is seen and from it the varga of the needed chaapa subtracted and balance is multiplied with 600. This varga is reduced from the varga of R to get varga of cosine.

From the 2 dimensional Cartesian coordinates and orthogonal axis and a rectilinear rectangular system Varahamihira leads us to a much much higher trigonometric functions of sine cosine and to spheroidal/ ellipsoidal/

geodesic or geoid relativistic astrophysics and to energy value calculations. Relativity observed at different levels at different sites is a matter of geodesy . But varahamihira is concerned not only with the measurement of earth's surface as the Greeks in early period of their astronomic history but also of the measurement of the universe or multiverses on the same law but on different dimensions.

We must remember that only in 1600 after British came to India and learnt astronomy from Indians the Greenwich observatory came into being ,not before that,though they speak of so many Greek astronomers, and in 1884 only Greenwich accepted the 15 degree steps of longitude and 24 hour one hour timezones (5 yrs after that came the translation of Thibout on Varahamihira) and UT or universal time

was accepted after review only in 1972. But India had all these, based on a universal time at zero point as Lanka. And from vedic times. Every other sidhantha know this and accepts this and the calculations are based on it and the minimum of 27 star clusters as the fixed environment against which we study movements and comparative planetology (Comparative planetology means using earth as a benchmark against which we compare other planets ,celestial objects . Among planets Mars the red planet – chevway means the red one is having a old tormented past and venus is more like earth as a twin of it and the various time periods for each of them to revolve around sun etc)

In a flat square map a whole worldmap is constructed spanning 36 cm by 72 cms

and this projection is centered at Lanka for Indians .(Now at Greenwich)The scale 1:300000000 at equator was used at least 7500 BC onwards ,which is the Mehrgarh period with Lanka at equator as center

1 cm on map is 3000 km on earth.

Pa or Paridhi (now called pai ) as a transcendental number was calculated earlier than the vedic/sulbasuthra periods. It is irrational as it cannot be expressed as the quotient of 2 integers,

$\text{Pai} = 4(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} \dots) = 3.141592653590$ . It is transcendental because it is not the solution of any polynomial equation of finite length that has only integer coefficients and integer powers of variables. There had been several discrepancies historically in pai

and its calculation ,some of them are given below.

3 roughly.

*Paridyanayanam* as the old method  
*vyasavargaadhasagunaath padam*  
*paridhirithi*

If *vyasavarga* is 3,multiplies by 10 and the square of 30 which is 900 is made into 1/10th to get 90.squareroot of 90 or squareroot of  $9 \times 10 = 3$  squareroot of 10.

According to *vyasebhanandagnihathe vibhakthe*

*VyasaX*  $3927/1250$  is the *sookshmaparidhi* and *vyasaX*  $22/7$  is the *sthoolaparidhi*.

By this method

*Chathuradhikam satham ashtagunam*  
*Dwa shashtisthathaa sahasraanaam*  
*Ayuthadwayavishkambasyaa-*

*Sanno vrithaparinaaha.*

If  $104 \times 8 = 832 + 62000$  vyasa 2000,

$Pa = vyasa \times 62832 / 20000 = 62832 / 20000$

with 16 ,3927.1250

$3927 / 1250 = 3$  and  $1777 / 1250$  go on doing it to get  $3 + 1 / 7 + 11 / 177$

$11 / 177 = 1 / 16$  avoid it. Then

$pa / vy = 3 + 1 / 7 = 22 / 7$  which is only a gross measure IF YOU DO NOT AVOID THE FRACTION ,it becomes 3 and  $16 / 113 =$

$355 / 113 = 3.14159292$ (Bhaskaraccharya)In

Leelavathy of Bhaskara gives this.The same is given here by Varaha in another way.

Aryabhata also gave it in a different way in the form of a question, If the king traveled 80 yojana and in 7 nights reached the city of enemy .and if in the first day 2 yojana is traveled every day how much yojanas he traveled ?

First day =2

Dhanam=80

Total time =7 nights

Answer=3 and  $1/7$  or  $22/7$  because 1st day 2,2nd day 5 and  $1/7$ ,3rd day 8 and  $2/7$ ,4th day 11 and  $3/7$ ,5th 14 and  $4/7$ ,6th 17 and  $5/7$ ,7th day 20 and  $6/7$

So that  $2+5+8+11+14+17+20=77 +3$  gives 80. To travel a circle of  $22/7$  once for 80 yojana means it has to be at the equator. Because  $80 \times 40 = 3200$  for equator. And as I have proved at different occasions the  $22/7$  is the sruthy/swara of naadabrahma.

The text then gives the jya, and the computed arc , for 90 degree from mesha to end of Mithuna.

90 degree if divided to 12 equal parts give one is  $45'$ . since there are 480 parts in a circle the total is  $21600'$  or  $1296000$  sec.

The relation to mass or bhoopinda for time is thus  $72 \times 4 \times 79.41$  OR 80 ROUGHLY.  
=2287008

2280 is when we take the varga of 19, as 570.

The other values given by different people at different periods are

$$256/81=3.1604938$$

$$25/8=3.125$$

$$157/50=3.14$$

$$22/7=3.142857$$

$$355/113=3.1415929$$

$$\text{sqraroot of } 10=3.1622777$$

In India all these were studied but before vedic period itself we had settled for a  $22/7$  value. Because it is also the

transcendental paridhi of the eternal naadabrahma expressd with 22 sruthi and 7 swara.

10 based decimal system of India gave us logarithmic calculations which are easy with decimals.

Projection means a map. but it also means to shine a light from inside a transparent globe,say ,the sun. And catch the cast image on a piece of paper flat against the surface of the sphere, or reflecting light onto a polished mirror , concentrate it onto a paper so that it catch fire and burn.

Projection on to a plane is azhimuthal. Onto a cylinder or cone –cylindrical / conical projections. Plane share a single central point with globe.Azhimuthal aspect is at poles .Simple aspect for

cylindrical contact with equator is the equatorial aspect .Cone is the contact with some other parallel.So we can make orthographic azimuthal projection at poles,gnomonic central azimuthal projections at simple aspect.Varaha is mentioning all these types of projections with his calculations ..He was very thorough not only with measurements of earth but also with that of comparative planetology and stellar maps

We know that Euclid's theorem stated that the angle subtended at the center by any chord of a circle is twice the angle subtended at any point on circumference by the chord. Varaha knew that making the rays parallel and all impacting our mapping surface at right angles we can get an orthographic azimuthal projection. At 45 degree the gnomonic

map of varahamihira reaches the same diameter as the orthographic map. And to 45 degree latitude it provides a seasonal map.

A lobe fitting into a cylinder the contact line can be any great circle and the projection plane will be in the plane of the contact line. (Now probably you know why Pythagorus wanted to make such a symbol in his tomb). The cylinder makes contact simultaneously with opposite sides of the globe especially at the equator , and hence, Lanka is ideal, than Greenich or Greece for it. You can just rotate the diagram clockwise to 90 degree without loosing the magicality of the diagram. (like the magic squares of Ramanujam)

A compound projection of a circle of radius  $R$  , sphere of radius  $R$ ,and a cone of base radius  $R$  and into which the cylinder fits in makes the beautiful formula of balance of the srichakra /ashtadala padma.

A process of mathematical analysis that for a given function derives a second function .Certain functions have a limit Zero .Several mathematical functions have the limit and are differentiable ,a common example being  $e^X$  if  $e=2.718$  If  $X$  is 10, the dasamsa position is lost.The equidistant ,equal area,conformal attributes are mutually exclusive of the other.A 4th ,the loxodrome ,lines on a map have consistent azimuthal bearing which is of vital importance to ocean navigation .It is a subset of conformality .

And the navigators map based on pole star or dhruva in India developed for this purpose.Till medieval times these maps were used .(The first projection called Mercator projection in the west was made in 1569 ,(before that Etz laub in 1511)and immeadiately the name was given to him,forgetting al the maps used till then by the ancients.The habit of giving the European discoverers name to ancient knowledge is always there right from early Greek people.)Even now flights use loxodromes to fly along parallels with length of 8000 kms .The great circle routes by direct flights cross 70 degree parellel or nearly 7000 km)

Comparison of scales on map and Globe

Length along meridian on map/the same along globe=length along parellel on map/same on globe

Length along meridian on map/length along parellel on map=length along meridian on globe/length along parellel on globe.

The variable hypotenuse or the changing kalaakarna of Indians clearly show that they knew the hypotenuse is always different due to the movement of celestial objects and their orbits. Wherever there is gathi or movement, there we get kalaakarna , and wherever we find kalaakarna there would be gathi or movement, they state. The shutakarna was called a kakshya or orbit which shows they

knew the laws of Kepler and Newton very well. Wherever the karna increase there the bimba or mass of the object is seen reduced or in apachaya and vice versa wherever the karna decrease, there the bimba is increased

*Yatha yatha karno vardhathe*

*Thatha thatha bimbam apacheeyathe*

*Yatha yatha karnohrasethy*

*Thatha thatha bimbam upacheeyathe  
ithy.*

When distance increase, the gathi or movement decrease and the size of celestial object increase as in sani or Saturn and guru or Jupiter. And vice versa. Simply because paithamaha, vasishta, and the others, including varahamihira knew this rule can we say that they lived after kepler and Newton?

## Arithmetic series and arithmetic mean

$1+1/1+1/2+1/3+1/4+1/5+1/6+$  is an arithmetic series. The value designated e, like pi is transcendental and irrational.

$e = 2.718281828459\dots$  occurs in differentiation and integration naturally. Putting a value x in the exponential series we get the arithmetic mean

$$e^x = 1 + x_1/1! + x_2/2! + x_3/3! + \dots$$

(where i is a mathematical practical expression)...

A secant projection is a straight line intersecting a circle or other curve, the

section between the intersection being a chord.

The geometry and trigonometry of a secant gives several variations for  $R \cos \theta$ . Equidistant cylindrical projection (rectangular, equirectangular, La Carte parallelogramatique) the value was 30, the oldest used by the mariners of Tyre (the socalled Phoenicians) two millennia ago. In 1855 Gall stereographic, isographic used 45, in 1929, Russians used 55, in 1937 B.S.A.M used 35 and in 1953 Edwards used 37.4. For the Tyre people the standard was parallel through Rhodes island about 36 degree North, giving a lateral shrinkage of 4.5. If we use the 45 version, the shrinkage factor becomes  $0.7071 = \cos 45$  degree. That is from equator to 36 degree (From Lanka to Himalaya) is the value which Varahamihira

gave. But he has also given the 55 degree with cos theta 57.36. Because the ancient Indians were familiar with the earth upto the North pole. The kimpurushavarsha and the Chakshushi river and the Siberian and the Norwegian lands were known to Indians and Caldwell has shown how the Norwegian language is the same as that of Dravidian language and Padma Subramanium has pointed out the comparison of the Indian and Russian iconography . The fact that the Tyre people use the same as that of Indians is another proof for my theory that the Phoenicians are Indians from the west coast of India. The conic projection of Ptolemy which is 2000 years old, is comparable.

The values of Varahamihira for the arc and chord for  $90^{\circ}$  from Mesha to Mithuna are given below. There are 24 values computed thus.

Number	Chapa	In mt s	Jya	X=1.0 000A T 0 0	Y=f(X) 0.0000
1. Me sha	$3^{\circ} 45$	22 5	7.7 1		
2	$7^{\circ} 30$	45 0	15. 40		
3	$11^{\circ} 15$	67 5	23. 7 5		
4	$15^{\circ} 0$	90 0	31. 4	0.990 0	$0.1860=0.12$ $40+0.620$
5	$18^{\circ} 45$	11 25	38. 34		

6	$22^0$ 30	13 50	45. 56		
7	$26^0$ 5	15 75	53. 5		
8	$30^0$ 00	18 00	60 0	0.960	$0.3720=0.310$ $0+0.0620$
9Rish abha	$30^0$ 45	20 25	6.4 0		
10	$37^0$ 30	22 50	13. 3		
11	$41^0$ 15	24 75	19. 7		
12	$45^0$ 00	27 51	24. 2	0.896	$0.5571=0.372$ $0+0.0613$

13	$48^0$ 45	29 25	30. 13		
14	$52^0$ 30	31 50	35. 13		
15	$56^0$ 15	33 75	39. 46		
16	$60^0$ 00	36 56	43. 6	0.798	$0.7346=0.372$ $0+0.577$
17	$63^0$ Mith una	38 24	3.4 2		
18	$68^0$	40 50	6.5 7		
19	$71^0$ 15	45 00	9.4 2		
20	$75^0$	49 50	12 2	0.673	$0.8936=0.372$ $0+0.0501$

21	$78^0$ 45	49 75	13. 47		
22	$82^0$ 30		15. 4		
23	$86^0$ 15		15. 49		
24	$90^0$		16. 5	0.532 2	1.0000=0.976 1+0.0239

Each of these values are from Paithamaha sidhantha and other Indian systems . Please note the Rithusapthanava figure at the 90 degree.(which at the end of Mithuna is Punarvasu nakshathra 10 degree and is the Dakshinayana of Sun and as it is said in several scriptures it is the Manthradevatha of Agneyaasthra given by Kasyapa in Rgveda (the only

mantra in Rgveda ascribed to Kasyapa, the first forefather is that sloka)on Agni , from which Agni gets the name Jaathavedas. And in Thanthra texts like Saaradaaathilakam this is said to be the form of the devi who is both soumya and Ghora,both loving and creative and destructive if not handled properly.

Why he computed only upto that? Because the rest is just a magic square which can be computed by rotating the figure 90 ,180 and 360 degree.

For a spherical surface the 43 triangles of the srichakra are to be computed and it is more complicated than on a planar map. The triangle with one side on equator and the other on the pole has 2 right angles and the angle equal to the longitudinal

space giving a total range of 360 to 540 degree.

Then comes the law of the sines relating all sides and surface angles, the law of cosines for the sides and one surface angle, law of cosines for angles each relating to all surface angles and one side, the law of tangents and thus the spherical geometry for the entire longitude latitude scheme, and the comparative planetology and study of the fixed star and their measures etc clearly shows that right from the vedic times paithamaga and vasishta including knew the energy or agni of the spheroidal cosmic system with its relativity and generation of light and sound and time which is unending and cyclical. Then where is the argument of Thibout and others? The pure




360 330 300 270 240 210 180 150 120 90  
60 30

computing the surface distance taking R as  
6371 km X 1.1012 =7015 km or 3788 INM  
see the position of India,Lanka,South  
Africa and South and central America and  
their relative distances by oceanic routes  
,if using the monsoon winds.

The distance of the cosmic sound waves ,  
we know has the same periodicity as the

light and time .Hence I have given the values of the pai and its fractions on the right side ,and the 7 swaras in a cylindrical cosmic space.

Nowadays everyone know the Langrangian – Euler equations for globular projections and for the modern musical notations used by the western world.But ,noone knows that it is the old one used by Indian astronomers.

In Lamberts stereographic projection he halved the longitude, and developed a multiplier for the latitude.(Note that the parallels and meridians are circular arcs . finite and infinite. At equator for meridians arcs concave towards the central meridian and for parellel arcs concave towards the poles with a central straight one of each..

The kuttaka or differential calculus and differential geometry was used by Indians. Each of the indeterminate parameters can involve both longitudes and latitudes in a projection. So we have to delve into differential geometry. The curved surface of the 3-dimensional geometrical realm, the curve along any surface that traces the shortest route or the karna between two points become the geodesic. Now calculus has to be expanded from ordinary to to partial differentiation. A quintessential feature of differential geometry Then for the global surface XYZ or coordinates we get as functions and on a parametric parellellogram the Fundamental quantities EFG are obtained from them. A parellellogram defined by vectors is a parametric parellellogram. E and G represent distance change along the

vectors and curves respectively .There is linear distortion ,distortion of area and of angles which we have to correct and that correction is called the sphutam. .The ellipse,associated circles,applying linear algebra , and optimizing distortion by balancing the scale arithmetically as Euler attempted come with this knowledge only.

The differentiating equations are balancing equations.It was Schwarts in west who used transformations for an ellipse into circular disc,.the sphere into each of 5 regular polyhedra.For a quinquinial projection the world conforming into a square , the 5th of a diamond form,representing the equator at center, and the south pole as center of the oceanic region ,(not the north)and the shortest distances by ship, when oceanic

currents are there ,have to be from the regions in and around the Indian ocean, and the map also has to be computed by the people of these areas, and India happens to be the first candidate to be thought of because of its position, long history,its fame in the foreign countries even in prehistoric times and the other details which I had already discussed in my history articles. The epicycloidal projection of the oceanic circulation is in favour of my view as Phoenicians being Indians. Oceanic current pass from SE Asia to Indian subcontinent ,touch the southern tip of India and south India in general and then to Africa and to South America. Another current straight to Central America from South East Asia is there. So these are the candidates we have to consider for the knowledge of

starwatching, mathematical astronomical computations, and geodesical and relativistic observations associated with navigation, and trade and commerce. The value of India as a very rich and prosperous country with a well organised agrarian and urban central administration and a very long history of dynastic generations and scholars are all in favour .

In 1669 When Newton put forward the theory of gravitation and said that the earth has a bulge around the middle ,the geodesic latitude. and when this was resolved in 1730 using data from extreme locations in Finland and Peru ,c.s of the globe is close to elliptical became established. Why at extreme locations?

This is the answer which I want to elicit. The reason why Indians and Srilankans knew the secret is because they were aware of both Finland and Peru .

Varahamihira uses the differentiation of the vectors.Why? They with their dots , cross products,are needed to study the ellipsoid ,the infinite series and the binomial series.The ellipsoid dimensions are written as a ratio.Latitude measured as L distance measured at center of earth. Acclerated by observation ,elevation of some celestial object .That elevation measured as directly relative to the horizontal or else as a complementary angle relative to a vertical.Visible horizon around a ship. On land,a gravity set reference table made.The difference in gravitational attraction between equator and pole is less than  $\frac{1}{4}$  of a degree.Yet we

must recognize the 2 forms of latitude. The geocentric and the geodesic. The latter is observable and used in everyday life. The other for cartography. A conversion formula is established between them. The maximum discrepancy between the 2 at 45 degree is less than a 5th of a degree ,the proportional effect is greatest at latitudes. It gives as a seamile,as 1 mt of arc along meridian. Minimal value at equator, despite the radian being the longest there.

With geocentric latitude ,1 mt of arc produce a length exceeding 1855 miles at equator and less than 1850 mile at pole .

With geodesic latitude Less than 1843 miles at equator and exceeding 1861 miles at pole. The standardized nautical mile is thus 1852 miles.

Now we have the 3-dimensional ellipsoid with 3 dimensional coordinates.

Differentiate these to get a matched square pattern for the  $X$  and  $Y$  ( $t R \cos \theta \cos \lambda$  and  $t R \cos \theta \sin \lambda$ ) The fundamental quantities of ellipsoid in terms of actual longitude and latitude., the first equation is square of radius of a parallel circle . Calculating the distances and angles on ellipsoid surface.

1. Radian (distance along parallel)
2. formulae for intermediate distance.
3. Integration of this established distance
4. Put  $\theta = 0$  in the binomial series for the integrand and integrate and get the coefficient defined
5. Multiply the infinite series by constant  $(1-\lambda^2)$  to give the value where

coefficients ,each of series converge to positive value less than 1.

On a sphere the shortest route between points along a great circle defined by intersection of spheroidal surface with plane through 2 points and the geocenter. The great circle route is still used in ellipsoidal world (geoidal )shortest route is not a plane curve is a geodesic ,running very close to the geocenter through the 2 points.(exactly within it for the routes along equator and the meridianal circle) hence its length inherently close to the value stated for the sphere.

$R(\pi/2 - a \theta)$

$R=6371$

Therefore  $1.1012 \times 6371 = 7015$  km or 3788 INM .Except at the pole and equator where the anhelic and geodesic latitude

are identical ,everywhere else anhelic is greater than the geodesic latitude.This is the inverse of geodesic to geocentric picture.The difference is similar ,so that anhelic latitude is relatively close to geodesic latitude.At 45 degree the anhelic latitude is 1/8th of a degree less.

For Everest the modern value (maximum )is 6377.304 KM , Lambda being 0.081473,F (flattening 300.8)and taken for entire South Asia.The current UGS 84 value for the whole world is 6378.137 and 6356.752 , Lambda 0.082819,f is 298.257

If you refer to the Geodetic ref system 1980 or GR S 80, and its modified geodesic system 84 or WGS84, you will find the thririthu or 63 of Varahamihira and his

ancestors in the radius of the earth, semiminor axis or polar radius, mean radius, radius of authalic sphere, equatorial radius of earth .

The fixed starlimit of 39 for 3 stars in the gravitation geocentric constant and earth gravitational constant, the dynamic form factor excluding the permanent tide patterns as 108 and its exponential values (which is very common in all Indian calculations), the angular velocity factor of earth 729 ... (The importance of this number, I have spoken about in relation to vedic mathematics, cartography, musical traditions, Thanthric, ayurvedic and yogic traditions elsewhere.) as given in Varahamihira's calculations.  $f$  or flattening is 1.298.257223563. as a ratio.... Where on earth you have such scientific knowledge incorporated into all art and science forms

and into common man's life and lifestyle except in India? And how can it be borrowed from someone else ? The very fact that zero was invented by Indians for exponential as well as quantum level calculations is enough proof for their knowledge.

For latitudinal zonation each divided into 8 degree bands from 80 degree south to 72 degree north.(total 152 degree which is the mean of Raahumaana from 150-153) plus one 12 degree band from 72 degree north through 84 degree north. Distance from equator to 84 degree north is a span of 94 sq mt or 9350 km and only 90 in southern hemisphere.Total of 184 sqmt as taken by Paithamaha(183 )not 180 equal .So he takes  $183+183=366$  ,not 360, and later ones took it as  $365 \frac{1}{4}$ .

MSL or mean sea level is the geoid as it is called and what affects the sea level is the gravity /geoid and geodesic .This is watched by people in India because of their proximity to sea and the monsoon winds .From the gyration of axis over millions of years to the double cycle of tides within a single day.The lateral movement of crest only 10 cm in an year. The elevational movement is greater.

The Newtonian constant of gravity  $G = 6.674 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$

$M$ =mass

$D$ =distance from another mass

If spherical first gravitational value for gravitational acceleration of earth's surface  $= 9.820 \text{ m s}^{-2}$

MSL in 1967 was assessed as 62636860.85  
m<sup>2</sup> s<sup>-2</sup>

In 1980, as 62636860.850 m<sup>2</sup> s<sup>-2</sup>

The sea south of India is 110 m below the ellipsoid whereas across New Guinea it is 80 mm above the ellipsoid. These values are for the geostationary satellites. The fact that the Indians had known the geometry of the tilted view of the globe, its mathematical, cosmological implications etc and the fact that they were a seafaring people with a strong centralized administration and a decentralized village and urban economy is what is important for us now. For this the mathematical calculations of Varahamihira, I present as a strong proof.

Rahumukhaanam chakram ,the 10th sloka of 6th chapter denotes Rahu with the day and night as the earth.The law states where the highest and the lowest positions of the earth's orbit have reached at a particular time.It is a geocentric view of an observer from earth.zero bindu is Lanka.The point 223 degree beyond is the first point of Rahu.That is take 223 from east and west of Lanka.and from south and North also.

On the longitude ,from Tehran (51 degree E of GMT )in Iran to Reo de Janero in Brazil (43 degree w of GMT)is 94 degree and it is for the men who belong to Night when compared to Lanka .(They are the asura or those who belong to Ra,moon)Towards the east of Lanka ,the rest of the globe is for the Ho (So )or people who worship sun,or day.Thus the HORA is divided .

The division of North south I had already mentioned .The chandrachedakayantra of Vrahmihira is a projection like this and from it one can deduct the lunar eclipse.The deflection or valana is marked .After stating the relativity of observers position,in ch 7,he starts with the parallax rules.

In 8th ch he goes on to discuss how to see the sphuta of this error of parallax.And how one can watch a sun's eclipse for proof of it.He uses a lunisolar correction .The computed vlues of the jya and the formula when studied show the sarvakhanda as 603.95 if we use the first khanda as 34.72.This is used by Paithamahasidhantha.Both Romaka and Poulisasadhantha use this number showing that all the sidhanthas were

following Paithamaha with slight variations only.

It is because the earth and its orbit are not equal ,that the astrologers/astronomers of India add the calculated difference in southern hemisphere and decrease in northern.If the parallaxis lesser than the earths longitude it is southern and if it is more it is northern .To calculate the south and north of India Dwivedi takes Vindhya mountain. While for the earth as a whole it is Lanka as the reference point.(When you measure for a vasthu for construction , you take the center of the construction site.When you take the entire universe, you take earth as geocentric point of observation. The ratio is same but the exponential values are different )Avanathi is the parallax of latitude .

Sloka 15 of ch 8 states the bimba of moon and sun become small or big depending on the distance from earth and their gathi. Sphutabimbaanayanam rules for planets and for comparative planetology.

When the graha is nearest it is small (alpa) and when it is away it is big(vipula) and it depends on Kalaaparimaanam (the measure of the karna or distance) This is the law of Newton, as we know today.

From Kalpaadi to Saka 427 the aharganaganitha is

Souravarshagana 1955883606

Souramaasa 23470603272

Adhimaasa 721384204

Chandramaasa 241987476

Moon after thrimsadganitha= 725759624280

Kshayadina=11356023207

Reducing kshayadina from moon to get the saavana ahargana at midnight of Lanka =714403601073

Aharganam X 800 /292207 balance –42 is ardhaaathrakaalikakshepam. For day's kshepa add 400 to get –442.

This is used as Kaalaneelam revolutions by the Deccan people (entire South India and by North India probably from them )and the observations are therefore clearly by the seafaring nightsky watchers of the southern (especially western and eastern coasts of )India. And the fact that they use Lanka and not India shows how scientific they were. They didn't want the center of earth to be their continent /subcontinent but the nearest landmass to equator from their landmass and which

also has the same effects of the sealevel and the monsoon winds.

About variable hypotenuse rule of Varahamihira Dwivedi says wherever there is gathi or movement there kalaakarna happen . and wherever there is kalaakarna one has to assume gathi .It is because of gathi that the bhogyakhanda is changing (variable).This is seen in Astronomy and applied to music in India.

*Yatha yatha karno vardhathe*

*Thatha thatha bimbam apacheeyathe*

*Yatha yatha karnohrasamethi*

*Thatha thatha bimbam upacheeyathe*

Is an observation which Newton made in 16th century.

About the energy of the sun as watched during an eclipse Sreepathy said

*Drashtaamahi vyasadalenayasmaat  
 Samuchrithasthishtathy bhoomiprishte  
 Nabhaesthesia bhanornikatastha thastham  
 Prabhakaram sookshmam avekshyathe  
 sou  
 Vidheeyathe bhanuvapurmayukhai  
 Samanthatha pankajakarnikeva  
 That kesarairambaramadhyavarthy  
 Nireekshyathe thena cha sookshmamurthy  
 Vasundharaagolanirudhadaamaa  
 Doorasthithoyam sukhadrishyabimba  
 Maheejavrithopagathovivaswan-  
 Atho mahan bhaathyaruno virasmi.*

It is important to understand none of these scientists of India thought that the earth is flat like a mat ,and then had the immaturity to say that ,I have predicted an eclipse,as Miletus of Thales did!!!Yet,he is credited with the science and intelligence while the poor astronomers of India are not !!

Ch 13 of Panchasidhanthika starts with the independent opinions and analysis of Varahamihira on the cosmos and its relativity.

SI 1 states that the earth is a gola ,and made up of 5 elements – water,akasa,vayu,agni and prithwi-and it is seen in the middle of the fixed stars forming a zodiac which forms a nest for it

,to keep it in its place as if a piece of metal is kept in place by a field of magnetic currents from a magnet.

This sloka tells us he knew not only the shape but also of the electromagnetic waves around the earth.

Then the next two slokas give us the meaning of deva and asura according to Indian scriptures.

It says the earth has trees,towns, mountains, gardens,rivers,oceans on all the four sides and the center of the northern Devaloka is Sumeru (The modern Sumer of historians is sumeru of Ancient Indians.)Exactly opposite to it on the southern sphere is the land of Asura or Azorez.The man standing near a pond see his face reflected in water head down.The devas in Sumer think that they are upright

while Asuras are standing head down on globe.The asuras say it is the other way round.(Ref what is the theory of relativity L.Landaw Yu Rumer pp 13,34 It says the same about Moscow and Newzealand)

Varahamihira then says we,the middle people in the equator,or in the Bharathakhanda watch the flame of fire going up into the sky,a thing with mass when thrown up coming down to earth ,not going up into sky, and understand that the same thing as on equator,happens both in devaloka and asuraloka(north and south )

He is here stating the gravitational pull of earth and the shape of earth and the lack of knowledge of the Sumerians and azorez people of the other civilization while,the middle men or Manushya ,the

descendents of Manu know it .Here he speaks of Manushyaloka as Bharatha,the land of the Manu and his descendents.

SI 5 says above the sumeru is the point in the northern sky called the dhruva star. There is another corresponding point the dhruva on the southern side for the asura also.The incomparable starworld is seen between these 2 points as revolving regularly around by the pravaha ,a vaayu which is very powerful.Suryasidhanta and sidhanthasiromani also speaks of this pravaha.In Aryabhateeya,vishnupuranam and jyothiprakasaka of keralapaanini also it is mentioned.This winds are strong and are westerly and has both clockwise and anticlockwise movement says the above references.In sakunthalam 7th anka kalidasa also speaks of parivahavaayu. Latacharya says it is one among the 7

winds. Skandahora also knows of this. This is the monsoon winds experienced by the western and eastern coasts of India.

The azimuthal fields of the two poles have an unequal revolution ,and because of that the inner part revolve with great speed and outer side slowly, and this movement is seen as eastern movement in northern and western movement in southern hemisphere, and the convection currents join with the azimuthal field currents and this magnetic field makes the strong attractive force . These things are being understood only recently by the modern science. (Ref 39 New york academy of science Role of magnetic fields in physics and astrophysics vol 257 ,1975 pp 1-226) But the astronomers of India knew it . When I say this , the first criticism I get is that I am one among

sangh parivar!!! What a intellectual slavery for our scientific community and historians!! I cant imagine! What does a political party has to do with intellectual scientific research? They are just there to get political power.A scientist,like me, is least concerned with political power.

Sloka 6 says:- There are different opinions about the revolution of earth. Some people think that earth is revolving within a machinery as if a metal globe within a nest, and that only the earth revolve and not the atmosphere. The argument is that if so the birds would have lost their way. Varaha says ,not only the earth but also the orbit in which it is revolving also is moving .

Others ask,if earth is revolving why is the flags not flying west every day .Then ,

another doubt of theirs is that how can within a short period of 24 hrs earth completes a rotation/Varaha says the movement of the orbit and the mandala around the earth explains the behaviour of flag, of birds not loosing way and of the speed.

Sloka 8 is talking about the view of Jain astronomers that there are 2 suns and 2 moons and refutes it with observational data.

Sloka 9 says when the sun rising in the zero degree Mesha is seen as moving to the right to the deva in sumeru, the asura see it as moving in opposite direction to the left. But for the equator, at Lanka it is seen right above the head. He says the terms left, right, above head etc have meaning only if we say the point of

observation of the astronomer. That is why a zero point at Lanka is accepted by the learned in astronomy and relate the other areas with reference to it. (When British colonized India they knew this from Indian astronomers and made Greenwich, the zero point. Before that Greenwich had no history at all).

At the end of Mithuna sun is seen as 24 degree above head by the devas and for Avanthi people it is then exactly above head (because Avanthi is 24 degree north of Lanka)

At that time there is no noon-shadow of gnomon. At that time the northern parts of Avanthi see the shadow towards the north and the people to the south see the shadow towards south. The shadow is

therefore relative to the position of the observer.

That is why the ancient seers decided that the devas of the sumeru have day in mesha, rishabha and Mithuna and Karkitaka,chinga and kanni are nights for them.In sloka 12 he prostrates before the ancestors who found out this relativity .In sloka 13 Varahamihira asks, the path traversed from Mesha to northwards is traversed when coming back from North. So, why should the sun become visible in certain periods and invisible in others. For those who do not know the secret of the revolutionary path of earth in relation to the sun he poses this question to ponder over. The mandala or fields in the two hemispheres is equal not in measurement but in behaviour of

clockwise and anticlockwise reversal of current.

Being the earths paridhi as 3200 yojana

The formula  $9-1/9=1$  degree

$800 = 90$  degree. An observer at 800 yojana away, or 90 degree away see sunrise and noon.

He says in sl 17, Ujjain is near to Lanka but north to it, almost in the same longitude but in different latitudes and therefore both the observers have noon at the same time but the length of the day need not be the same except on the samarathra days. The sun on the samarathrabindu or vishuvath point making sumeru its center, and earth revolve around it and based on it the paridhi is fixed as 3200 yojana. If the sun is in the zenith, and revolving around the equator, or if the

earth on its axis which is the Meru ,and keeps each of its bindu on eqator facing the sun once –is the measurement.

Sloka 19 ,20 gives bhoomerusamsthanam.

From Avanthi to the north,586 2/3 yojana traveling ,we reach the middle of Meru.If we travel 800 yojana from Lanka also we reach there.The distance between Avanthi and Lanka is thus 213 1/3 yojana.Ujjain has 66 degree to travel to the north pole.Sloka 21 gives general rule for calculating this from any place on earth.sloka 22,23 says from Ujjain 373 1/3 yojana north the landmass ends.The north pole is upto 66 degree north ,and landmass ends at 42 degree.24 degree difference.Looking at the globe find out the truth about it.Then he gives the landmasses where the southern stars are

not seen and landmasses where the northern stars are not visible. All this shows how exhaustive and scientific the Indian astronomers were in their observation and calculation. For the devas of sumeru Lanka is always the horizon. sloka 29 tells us Lanka position. Lanka is just above the vishuvath latitude. Or just above the equator. The gola is equal there because it is landmass closest to equator. lenrth of day is 30 nazhika. Then he describes the gnomonic measurement at Lanka(not at Ujjain)in detail and how this is used for the oceanic people . How to find the sine and cosine and to balance it (salilena samam kritwa)

Sloka 34 says experts thus measure the entire earth and cosmos, like a person tasting a drop of seawater knows the taste of salt anywhere,

Sloka 35 and 36 are important.35 says moon is seen by reflected light from sun.only one part is seen while the other remain unseen as if a kumbha (spherical pot)is shown to the sun.36 says the the reflected sunlight from the moon which reach earth is cool and hence salilamaya.It is less hot but gives enough light for us to see,just like a sunray,reflected in a darpana gives us the energy of the sunray.

Why is this sloka important?

1.The ancient astronomers knew that sunray reflected behave in a particular way,looking cold and harmless but can cause a concentrated agni if used properly.This was a knowledge used by ancient seafarers of India to destroy their own ships when they were about to be

captured by enemies. It was a suicidal method to prevent their secret knowledge to be given away to foreigners. And they had brass and glass mirrors for this purpose developed by ancient craftsmen. This knowledge was transmitted to Greece only during Pythagorus times. The brass work and mirrors of Kerala is the proof for this. Nowhere else in the world you see this phenomenon.

2. The Michelson Morley experiment of using multiple mirrors to concentrate the sunray onto a single point was done in a crude way by these people and it is how they found out the exact equation for the energy, mass, velocity. It was not an accidental finding. It was not something they were copying either from any other civilization.

37 and 38 is on reflected sunlight causing the moons two phases.39 is on comparative planetology and movement of the 6 celestial bodies in their orbits 40 and 41 describes the zodiacal space from the geocentric position as increasing in order as if in the case of a wheel.The orbits nearer to the geocenter ,like that of moon,is smaller and that which is farthest like Saturn is largest.Since moon is nearest to earth,we see it moving quickly,while Saturn is seen moving very slowly because it is very far from earth.sloka 41 therefore calls moon sasi which is a speedy object while Saturn is manda or sana(slow object)and again this sloka tells us the fact that distance and speed are related was wellknown to all astronomers of India.And Newton's name

was not known to them, but certainly they knew the rule known in his name.

Chapter 14 is Chedakayanthra. The cheda was described in mathematical terms in earlier chapters. Here varahamihira speaks about the different yantra or ancient instruments used by ancient Indian astronomers. The first 4 sloka tells us of a sextant and its construction and use, 6 and 7 gives us construction of a golayanthra, and 8 gives us the gnomon. sloka 12 gives how with two wooden pieces or scales one can measure exact radius. And how sun and moon and their longitude/latitude are measured with these methods. sloka 15 gives a Matsyayanthra (Machayanthra) which is represented even in the Indus valley script showing its antiquity. How the machayanthra uses the raju or the sulba just as in the sulbasuthra of Uthanka is

noteworthy. Sloka 7 calls Horizon or chakravaala as Harijam or Hariyam, derived from Hari. chakra is the wheel of cosmos of Hari. And valana or deflection gives the harijam its name chakravalanam. And we know the valanam can cause energy which can be thousand times hot than sun, and is a powerful weapon.

Similarly a golakayanthra or ancient clock which is hemispherical and fixed so that we can raise it upto the latitude we want is described. (sl 19)

When I said that the Indians knew how to concentrate suns ray through a smallest point at least some might have wondered how? sloka 21 and 22 says.

Take a circular phalaka or mirror-or a brass polished to be like a mirror-and on it have 360 degrees marked. The vyasa

should be one hastha. The thickness only  $\frac{1}{2}$  inch. There should be a small opening in center. The opening is so small that the sunray at noon enters through it at an angle. There is a spot underneath the circle which is lighted up by such a ray. Or burned by it, depending on the concentration. If a rajju touching this spot and the center of the phalaka is divided into fractions we get degrees of the noon suns elevation in degrees. A smooth and minute gola (sookshmam golam) made of metal/iron with 4 bindus on the exterior connected with 2 rekha called kaalabhogarekha are used for exact observations. Between kalabhogarekha on either side of Mesham zero degree or Lanka mark the degrees of the various raasis after close observations. If we raise the gola to a specific northern latitude we

can measure the naadikas for any day,any place.sloka 26 says in kaalachakra,as long as Mesha zero is the eastern bindu the length of day increases.When it is Thula the length of day decreases,

Sloka 27 says all the yantras have raju, water,bhooghanta or part of earth as their basis.On a plane the shape of a tortoise or man we can make the yantra.The yantra are taught only to honest shishya. Not even to son,if he is not honest and worthy of teaching.

29 and 30 describes how to do measurements based on stars and moon at night for the seafarers this was very useful.31 and 32 gives ghateeyantra or waterclock of India.

This is a very interesting part.This type of clock was in use in India right from the

prehistoric seafaring days. It uses the archimedes principle for floating a ship as well as for sinking a ship when one is confronted with the enemy's capture which the Phoenicians employed .

Sloka 31 asks to make a vessel with the shape of half a sphere. It is made of Tamra. And in the center of the bottom is drilled a very small opening which allows tiny droplets of water to enter the vessel from a pot filled with water in which the device floats. The drilling of the hole, and the thickness of the vessel are mathematically very precise and only a skilled sculpture can do it. The vessel is filled exactly when one naadika passes. The vessel then sinks. Like this 60 nimajjana or sinking , or 60 naadika is related to reading or reciting 60 sloka with 60 letters . and time needed to take 1/60

of the water in the kunda below to enter the upper vessel.Hence a measurement of water volume as well.It is 180 times breathing of a human being so that it is not only cosmic but also earthly and biological praana energy time that they are measuring .It was with this principle they sang their saama chant,made hourglasses,made ships, and sank them when needed.This vessel also shows how the thamra workers of India were technologically advanced.The craftsmanship of the ship as well as the art of the vessel just described show the science of India.The instrument was used by ancient people and it is not Varahamihira's discovery .Hence ,since all the 5 sidhanthas are before Archemedes and since this was the old way of the Phoenicians /Tamil speaking kerala people

and south Indians and people of west coast of India in general, who were having ships and oceanic travels from vedic times and used to measure time with such waterclocks the science of Indians is definitely ancient and far advanced than the Greeks.

The Greek water clocks were just floating devices working by siphon action and they didn't have the volume measurement technique and they didn't know how the Phoenicians sank the ships in specified time or how they burned the ships either. Till Archemeded time it remained a secret for them. The technique of making thin thamra vessels they never mastered. And the cavemen of Thovary wynad as well as the Indus valley people knew the secret of the hourglass and the ashtadala padma or the making of ships, vimana

from the same measurements (which I have described elsewhere).

The relation with chanda,music and swara and praana of this astronomical device is mentioned here.But Thibout says one of the reasons for considering the surya sidhantha as inferior to syntaxis is that syntaxis is related to grammer,music etc but Indian astronomy is not!!The 7 swara, the 7 praana,7 colours of sunlight and the 7 naadis of the human body function exactly alike is the basis of all science and arts of India and of astronomy too and it is known right from the time of Paithamaha to vedic rishi .sloka 33 states if you know the latitude of moon, and distance of moon from a nirayana star ,you can calculate the time when chandrayoga happen with that star .After stating this general rule the text describes the

positions of karthika or Pleides in the N latitude and Rohini or Aldegebran in the S latitude. The difference being 13 0 20 mts between them. And these are by luminosity one can easily identify and compare too. The nearness of Rohini to Betelguese alpha orionis and its mass when compared to Pleides is also comparable. The colour of Thiruvathira and its red colour as a supergiant red and Rohini as a white one nearby and the comparison of these 2 with the 7 sisters of Pleides or Karthika is the first observations made by any beginner to start with. Therefore Indian systems always begin with Krithika or 7 sisters who were mother of Muruka, Murugu and the water nymphs with Saraswathy as their eldest , and then to Rohini the star of Krishna and the favourite of Moon , and the red giant

Ardra ,the star of Shiva ,related to the Mrigavyadha or Kiratha,the father of Vettakkorumakan,of Ayyappan and the consort of Vishnu as Mohini.(Astronomy and scripture thus combine so that even a child can be educated in this way).The Indus valley and Harappan scripts bear testimony to antiquity of the practice. Then the 35th sloka speaks of the twin stars of Punarvasu in the Mithuna raasi ,and pushya ,Ashlesha ,Makha ,chithra in Kanni rasi covering 11 stars or 146 degree .(from Karthika to chithra)And the 22 stars on the other side including , (corresponding stars ) 292 degree (72 days less from 364 days in one solar yr).

Then he gives the method of conversion into inches from hastha or kol, and how to divide with the  $\frac{1}{2}$  of vishuvath gnomonic chaya and to add 15 inches as vyasa of

moon to its jya. Multiply by 10 and add vishuvath samarathrachaya 21 times Then we get vinazhika. Calculating the kranthivrithabindu thus ,in the eastern horizon in the beginning of Karkata or Cancer . When the sun is there, with the mathematical instruments described view Canopus or Agasthya. He is seen as a thilaka on the forehead of the beautiful lady on the south side. Agastya is 90 degree longitude 80 degree latitude on the South. About the calculation of varahamihira Thibout says his latitude is lesser than that of modern suryasidhanth and is only 75 degree 30 mts. He doesn't take into account the difference in the point of observation from Lanka and Ujjain. or from a point in the southern parts of India slightly away from Lanka .but of the same longitude. He asks why

only a few stars are given? Why only in the eastern hemisphere the lunar yoga with 11 stars given? Why not in the west? If we know the yogabindu in one half ,we can compute the other half is the rule Varahamihira is demonstrating.And every Indian knew the other Nakshathra as well (the 27-28 nakshathra positions )is well known .In a postgraduate book we don't expect the kindergarten topics is the only reason why it is not seen in a karana grantha like Panchasidhanthika.Why the historical sage Agastya moved to the south?For observing the star now known in his name.And it is seen well from southern districts of kerala and Tamilnad well if you watch from a hill or from the coastal planes.The description of Agastya from the southern latitude as the fixed polestar of that region is very significant

.Just as the Polestar of the North and the saptharshi ,the 7 sisters and Agastya are given great importance in Indian astronomy.

Ch 15 is the jyothishopanishat which deals with the relativity questions.Because of the relative position of the celestial objects and the observer is dealt with.The mention of eclipse of other planets is made (which he describes in detail in Brihadsamhith).When he mentions graha ,grahamadhya etc for calculations Thibout says these words have no meaning at all.But these words are used by the modern as well.The center of the celestial body has to be calculated for eclipses whether in Sanskrit or English.He describes why the people near the Meru does not see the solar eclipse in full.Because of the gola shape and the tilt

of the axis of earth ,in the pole proper the sun and moon are not coming in a straight line with earth on the other side .There is always an angle between sun and moon in pole due to the axis of earth.The eclipse observed by people in India is not seen by other parts of the world or the time of the eclipse is different in different places.The eclipse is past,present and future for three observers in 3 different positions on earth.

The law of parallax is mentioned for an observer.Not even the directions east, west,etc are not absolute but relative because the point where the sun sets and rises is the same both in Utharayan and dakshinayan and it is the positional change of the observer (on earth)which makes these relative directions.The east west south north divides are gone when you know astronomy properly and it leads

to an advaitha of whole cosmos .This was what happened to the old vedic rishi of India.For asura at south pole and sura at north pole calculation of time is alike while for men at eqator it is 364-365-366 days.We are finding the day of week from ahargana.Ahargana depend on time and space and is relative.Latacharya calculate ahargana from sunset at yavanapura. simhacharya from sunrise at Lanka. yavanaguru from 10 muhurtha past the night of yavana.Aryabhata says one can count either from the midnight of Lanka or from sunrise of Lanka.

This happens because of regional differences.The method best suited is to take one region as niraksha or zero point and compute the others to it.India had done this before Ramayana period and Lanka was accepted as zero degree

because of its position near to the equator ,it will give more accurate results.The only other place which will give the same results being Tula in Mexico.These two points are Mesha and tula ,180 degree apart in the zodiac of India,makes sense for an archeoastronomer who is really interested in history and consciousness of our ancestors alike.

Sloka 22 and 23 gives more insights.

The sunrise of Bharathavarsha is noon for bhadraswa,sunset for utharakuru, midnight for kethumala.

Sunrise of Lanka is sunset in sidhapura, noon in yamakoti,midnight in Romakapura. sloka 25 says Romakapura has different longitude from yavanapura and their desanthalasudhi is not the same

.The Lankan calculation is not the same to these two ahargana because both longitude and latitude differ,

This statement is important.The scientific mind of varahamihira is actually teaching the general rules of astronomy to posterity. What Thibout argued is that Romakasidhantham starts calculation from the longitude of yavanapura and therefore it is Alexandrian.Or according to him Romakasidhantha is Alexandrian in origin.The similarity of Romaka to Rome and the concept that yavanapura is Alexandria are the aspects which form this view.

But Varahamihira clearly states that Romakapura and yavanapura are different longitudes.Then how come romaka sidhantha if it is Alexandrian use yavana

pura niraksha? If it is Roman why did it use yavanapura instead of Rome? If it is Alexandrian why was it called romaka sidhantha? A person of Varahamihira's astronomical caliber who knows that Lanka and Ujjain are in the same yamyantaravritha (longitudinal grid) but altitude is different and hence relativity is there, is stating that Romakapura and Yavanapura are not one. In sloka 26 Varahamihira says the opinion of Latacharya and Yavanaguru are not acceptable according to the ancestors of Indian astronomy. But he accepts the view of Simhacharya of Lanka and Aryabhata, his own younger contemporary from India. sloka 29 says that common man depends upon panchanga, days of week etc just for day to day activities and rituals to be continued properly. They are not

bothered about the science behind the calculations or of the discipline itself. But the scientists should not be like that .They should be more objective not to change the weekday or dinanatha etc according to ahargana of their observation from a very localized bias.

Ujjain is  $75^{\circ} 43'$  east of GMT. $90^{\circ}$  east of Ujjain is  $165^{\circ} 43'$  longitude in Hawaii islands and the boundaries of Russiaia  
BHADRASWA

Then 90 degree beyond is  $104^{\circ} 17'$  west of GMT which pass through Canada ,Mexico, Guatemala's boundary and N America.

UTHARAKURU

90 degree beyond is  $14^{\circ} 17'$  west of GMT passing through Spanish Sahara , Mauritania, Gambia,Guinea,western

boundary of Mali republic where  
Thumbuktu people live,KETHUMALA

Between lanka and ujjain 18 mts or  $40^{\circ} 2'$   
difference.Lanka is  $79^{\circ} 45'$  east of  
GMT.Compute then to  $169^{\circ} 45'$  E of  
GMT.Oakland islands,disappearing islands  
of Hawai,islands near Gardner pinnacle  
and boundaries of Russuia.YAMAKOTI

$100^{\circ} 15'$  W of GMT.Tula on the western  
part of the city of Mexico,Canada and  
North America.SIDHAPURAM  $10^{\circ} 15'$  W of  
GMTIreland,Spain,Portugal,Morocco,Maal  
i,Ivory coast,the islands of Atlantic ocean.  
ROMAKAPURAM

(Note that nowhere does Rome or Greece  
come)

Ujjain	Bhadraswa	Utharakuru	Kethumala
Avan	Hawai islands	Mexico,	Mali(Thumbuktu)
thi	,boundary of Russia	Boundary of Guatamala, Canada,N America.	Spanish sahara, Mauritiana Gambia,Guinea,
Lanka	Yamakoti	Sidhapura	Romakapuram
(Mesha	Oakland,dis	Tulaon	Islands of
on	appearin	west	Atlantic
east	g islands,of	of	ocean,Ireland
of	Hawai	mexico city,	,Maali,Ivo
	near		
	Gardner		

Bharatha	pinnacle, Boundary of Russia,	Canada North America	coast,spain,Portugal, Morocco. We
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We can see how wrong was the assumption that Greece and Rome have taught India anything at all. The view that since Rome is  $12^{\circ} 30'$  east, Lanka is not the present Srilanka but somewhere else also was put forth by these thinkers who could not even think of a Romakapura other than Rome and a Yavanapura other than Greece. If there is similarity between Rome and Romakapura ,there is similarity between the Kure islands of hawai and Kuru,Utharakuru also. And Guatemala and

kethumala are the same. Look carefully at the worldmap of today, even now we can see an area marked CHETHUMAL in Hondura coast between Mexico and Guatemala on the seashore, which the seafaring Indians called kethumala. The Atlantha of the Asura (Azores) people of Indians still exists in the name of Atlanthic ocean. The Athalantha or end of Athala is the meaning of that ocean's name. We still see a mountain called Maya, east of Guatemala and an old civilization called Maya in Mexico. Guatemala area. Kethumala and Romakapura are thus areas in the central and South America. Not Rome or Greece. The word dweepa for island is a Sanskrit one. The word is used as the name of the western island of Scotland (Lochairidh mahicfhionnalaidh dhuibh pp 84 Guinnes book 1986 Ref )

Even the Ireland cultures and the name of Bharathaani or Bharthani for the Brittani has resemblance.Britain ,the western end of the landmass including Bharatha ,the 90 degree point from there is kethumala or GUATEMALA.Even without the help of continental drift we can thus correlate the scriptural accounts of Indian history,its astronomical landmarks, and the oldest musical heritages,etc of the entire world. The very fact that in Indian cosmos the zero degree of Mesha correspond with Lanka ,and the 180 point from that is called Tula and such a point or land area actually exists in Mexico city is proof for contact between these two groups of people.And scriptures never said that they didn't accept from them.The Indian yavanaguru is Maya ,the asura (Azorez) architect ,belonging to Romakapura and

his daughter was married to the King of Lanka Ravana. The daughter of malyavan from Atlantis being the mother of Ravana they were actually the same race. And the Magha Brahmana of the ancient world is considered to be descendants of this group ,sons and relatives of Visravas ,son of Pulastya . Varahamihira himself was a Maagabrahmin(Maaghabrahmins of India have Bharadwaja as their ancestors according to legends) and when he says of his ancestors it was quite natural he was speaking of these old traditions ,not of Rome or Greece. He was teaching Rome and Greece and not receiving anything from them.

In ch 17, Tharagrahasphuteekaranam ,sloka 10 Varahamihira says that all the graha has to be independently observed and their sphuta calculated . The

calculation is different in the case of Budha or mercury alone. Because of its nearness to sun. And he gives the general law for all planets and the special rule for Mercury. The difference of movement in the perihelion, aphelion positions is known for this calculation. The first person to do this in the western world was Sir Isac Newton. But he could not find out the special rule for Mercury (which is described by varahamihira) and was rediscovered by Einstein. In 1916 the third astronomical effect of general relativity was published by Einstein and in it the special movement of the perihelion of Mercury was discussed. In sloka 10 of ch 17 varaha says about this and the details are explained in Brihadsamhitha. So, can we say, varahamihira had borrowed from the 16th century Newton or from

Einstein? The English translation of Thibout on Varahamihira's Pancha sidhanthika came out when Einstein was a child of 10. And in it (,after newtons period) Thibout says the special rule of Mercury is unintelligible to him.

The last chapter actually ends with the 61st to 65th sloka where Varaha states that This book is the

*Thaaragrahakaarikathanthra* for the students of Varahamihira in Avanthi which he made for the disciples who were confused after studying the Mars sidhantha of Pradyumna,jeeva (Brihaspathy)souri(saturn)sidhantha of Vijayanandin .He says about himself that he is one who even if understanding the shortcomings of others do not say that or criticize them, and such quality should be cultivated by his disciples so that they

become learned guru or in the Darsana of Varahamihira .He says he is making the tharagrahathanthra of ancient 18 jyothisha Acharya without competition or envy and just for removing doubts on the science.

After that 16 sloka are added by Sankarapanditha .He wrote it in 1673 Saka 1538 of the current year ,second aswina budhadina .His ancestry is Pandithasri peethambara,his son sri sriranga,his son panditha Naana ,his son panditha Govinda his son Sankara and he is writing this for selfstudy and for helping others(students)

India was a land of teachers in various subjects, and whenever they accept a theory from a Guru they mention the name of the Guru. The laws of Maya, is

accepted by Bharath .He is the yavanaguru for us.Not only astronomy but also the architectural patterns were accepted from him.Maya was in saakadweepa and he was a citizen of Romakapura and that he had taught Viswamithra some rules on the southern hemisphere when the latter had problems with Vasishta,who was following the rules of the Northern hemisphere alone is well accepted in all scriptures.Solon had these details (in part)from Egypt and later on Plato had spoken about the flood of the lost Atlantis etc .Atlantis,or saakadweepa and its parts Azores,canary islands etc were known to Azura s and to architect maya.When the floods happened several Atlanteans reached India ,some of them – Malyavan,kaikasi,the Maya family etc became part of us and their knowledge

was computed into our knowledge and their observations and the adventurous sea voyages to these distant lands from south India made Indian and South east Asian history very rich. Negating that ancestry is not in Varahamihira's or in Indian astronomers agenda. Such people ,if they had adopted from Pythagorus would have mentioned him as a revered guru and this does not happen itself is proof that Greece was a student of India and not vice versa.

Yukathana (yugasthana) or the land of architects and the oldest suncity in Titicaca lake are to be viewed in this light. The modern scientists view is that the suncity of Titicaca is 14000 yrs old. A people who knew architecture, astronomy ,mathematics as early as that existed and lost their culture and civilization. The

people in Bharath had shared the knowledge with these people as early or before 14000 yrs because if the city is 140000 yrs old, the culture must be older than that and Indian calculation of yuga and kalpa actually says so. The Mayaas of yugathana used Cowrie shells and dots and lines to do any number of complicated mathematics just as the astronomers of India do. And in the vedaas this calculation is seen showing the veda's antiquity. Their year or Thun is 360 days. 20 thun or 7200 days is one kaathun and 20 kathun or 144000 days one bhakthun. Like that 63 million years or one Alathun they had. Any big number they wrote with 9 positions just as Indians. The venus year of them is equal to that of Indians. Sikhnista their ancient place of observatory had equipments which

determined angular distance of stars which is only 0.005 to 2 degree. The sukra or venus year of Maya is only 72' different in one year and 6 mts in month and 12 sec in a day. This year is known to both vasishtasidhantha and poulisasadhantha and to Paithamaha sidhantha is worth mentioning. Sukra or venus as the guru of Azorez people is accepted in all scriptures of India, and his daughter is married to yayathi, who had an asura princess also as his wife. So the racial mixing is accepted. (not only the science and art of Asura) Yugathan is a name similar to sindhusthan, Rajasthan etc (sthan or Than is the position) The yukathan people believe that the suncity was made to mark the beginning of an era which is very fast and which began on 3114 BC August 11th. This is comparable to the short fast kaliyuga

beginning of India in BC 3104 when Dwaraka sank and Krishna lost his life. Note that these are only 10-11 yrs different .August 11 in Raasichakra is corresponding to Suns entry to Ayilya star last point in Karkitaka/first degree e of Simharaasi which is the birth time of Vamana or the new age sun (surya sidhantha)and when Varahamihira says that in his period Ayanam is in Ayilyam and it is based on the Romakayuga ,it simply means that he is following the calculation of maya of romakapura in Mexico-Guatemala-Sakadweepa/Atlantis and has nothing to do with Rome and his yavanaguru is maya and his yavanapuri is also the landmass of this yavanaguru as shown in table above.

I would end this chapter with the single manthra attributed to Kasyapa ,the father

of Vaamana in the Rgveda and which is for propitiating the soumya as well as ugra aspects of the divine mother to bring Agni and hence called the Agneyasthra. It is also called the Durgaamanthra and the IVC /Harappan people were worshipping this deity. It is significant to note that early Harappan times and lifespan of Krishna ,the dark God who controlled a portcity in west coast of India corresponds well.

(This manthra also shows the oceanic people's voyages across the landmasses .)

OM

*Jaathavedase sunavaama  
Somamaraathiyathoni*

*Dahaathi veda:sa na parshadaadi  
durgaani*

*Viswaa naaveva sindhum  
durithaathyayagni:*

OM